

Fig. 1

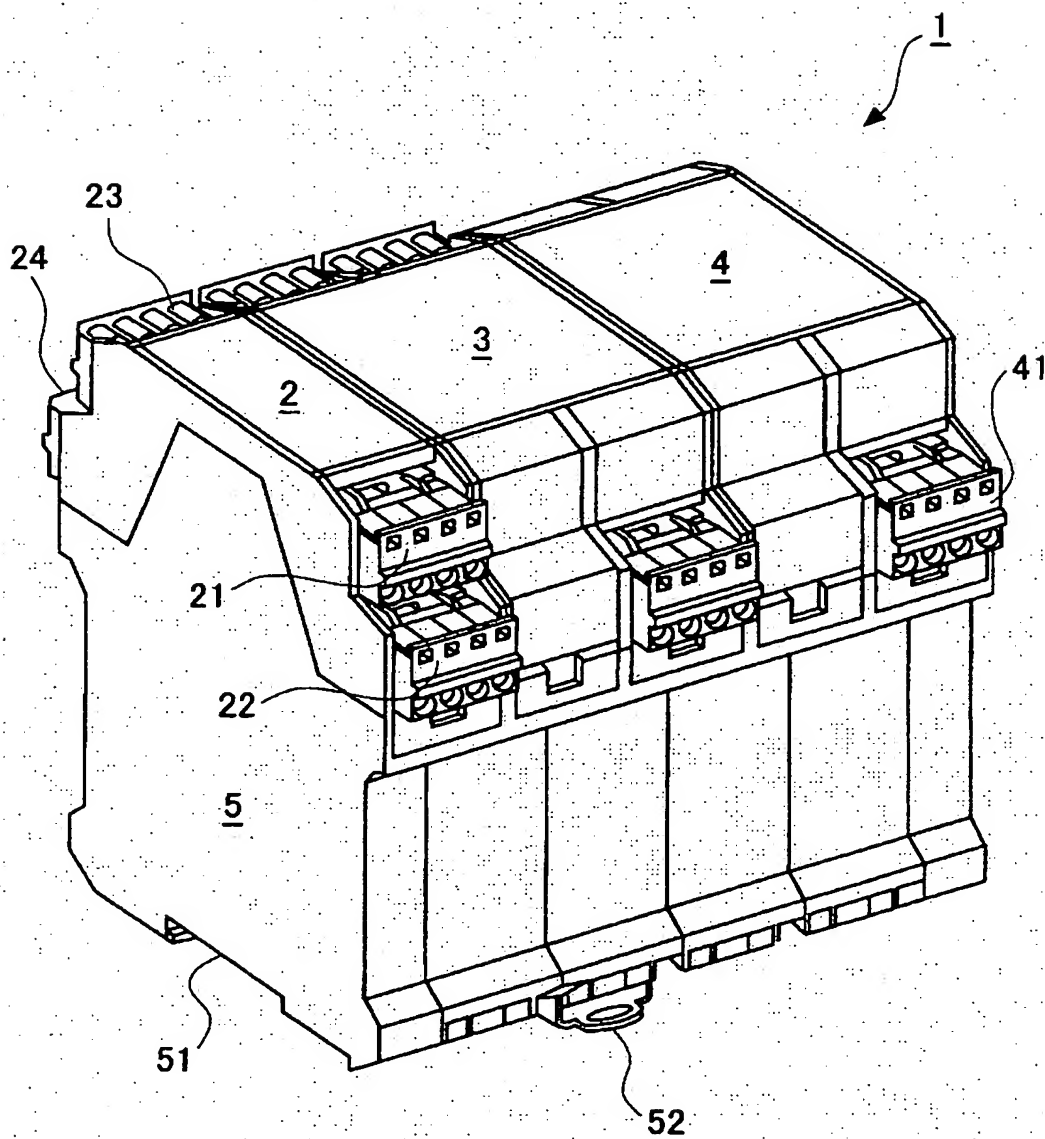


Fig. 2

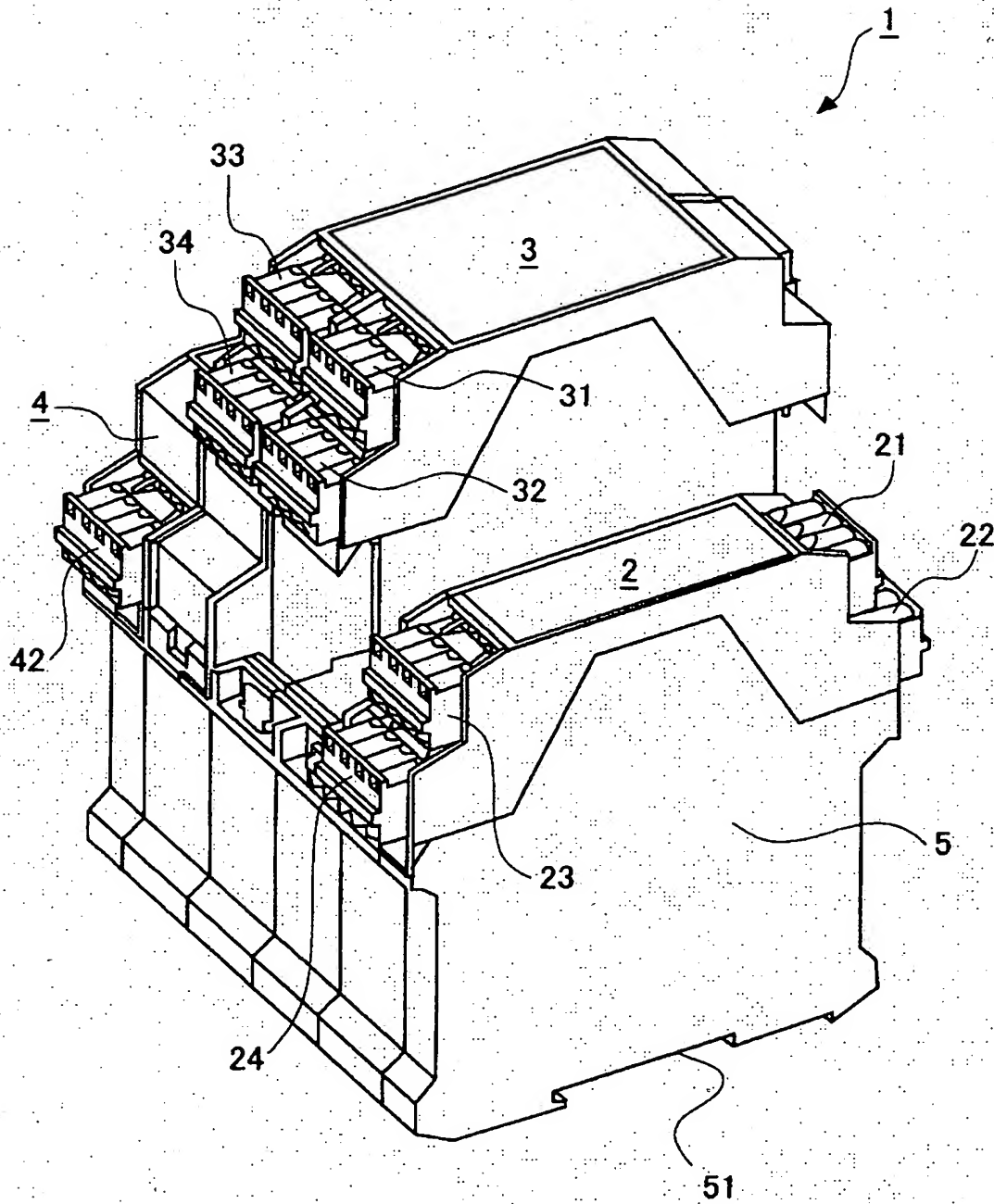


Fig. 3

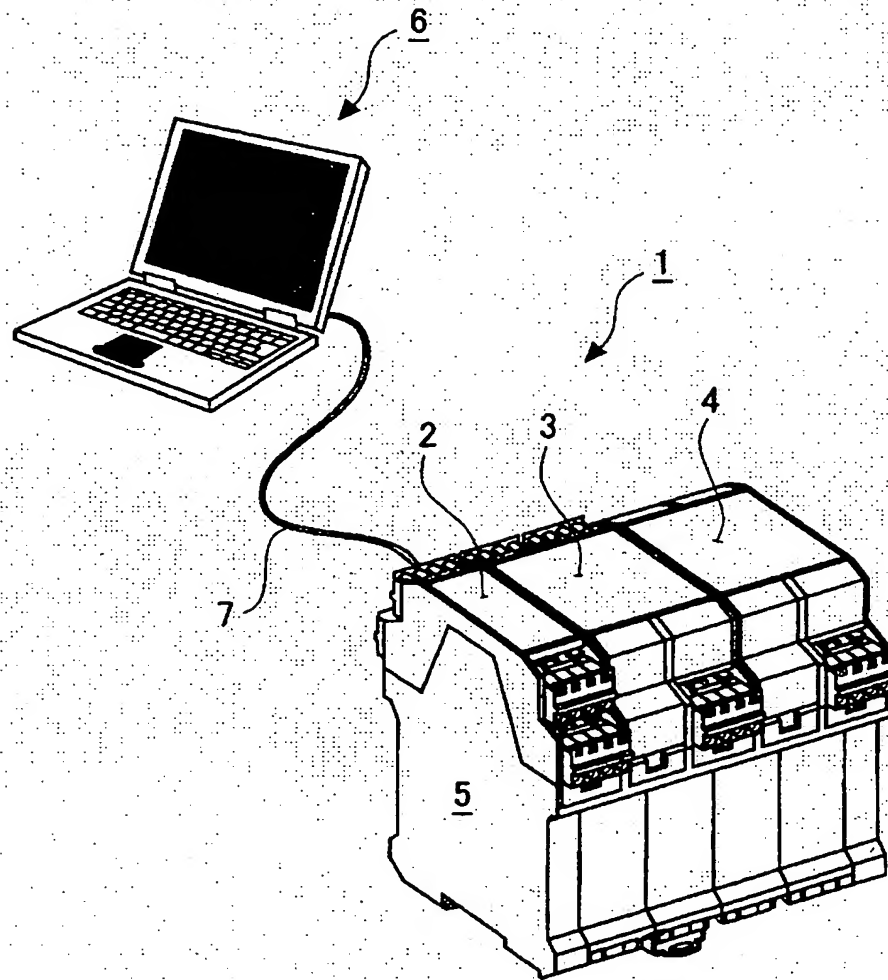
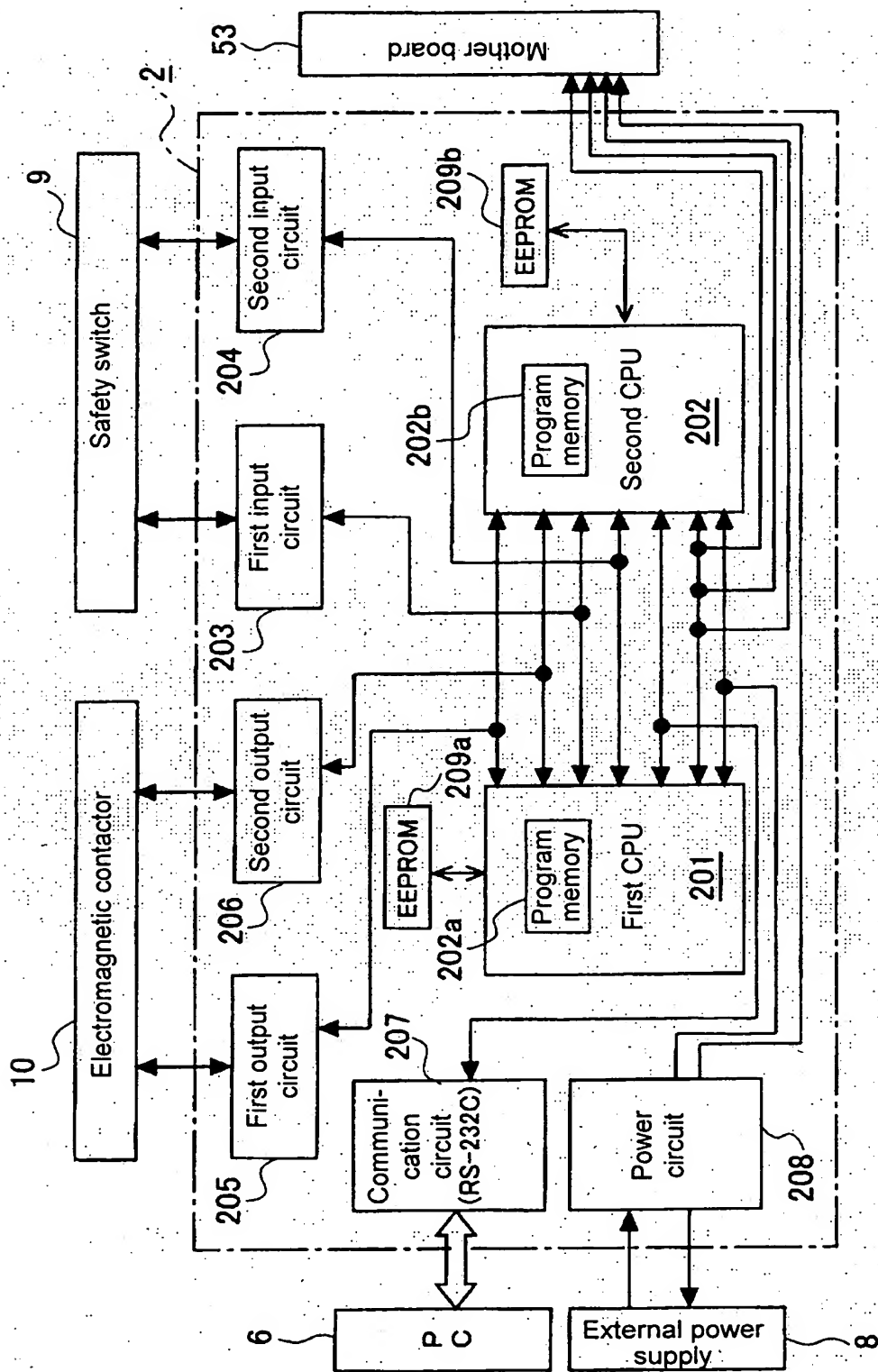


Fig. 4





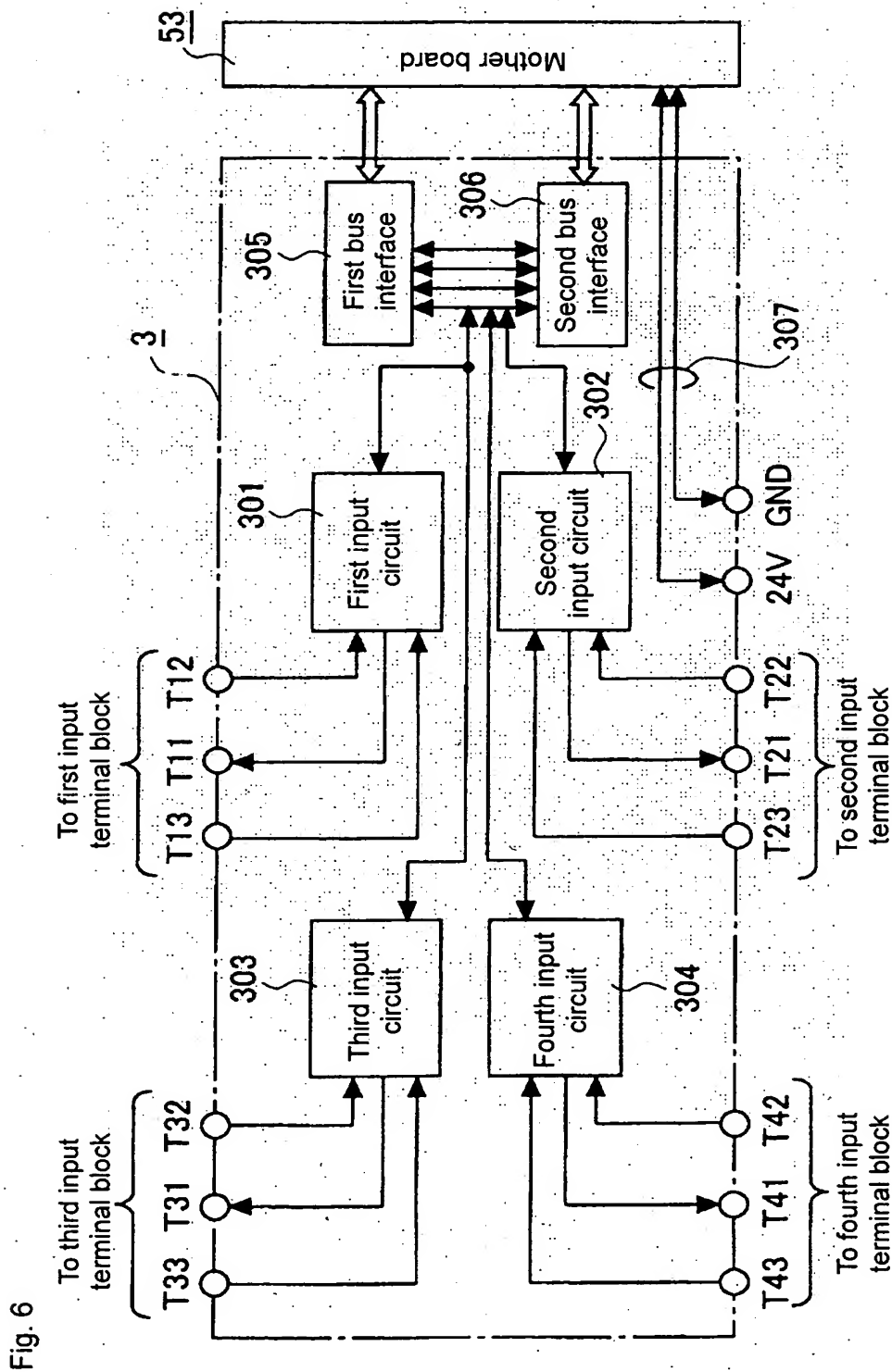


Fig. 6

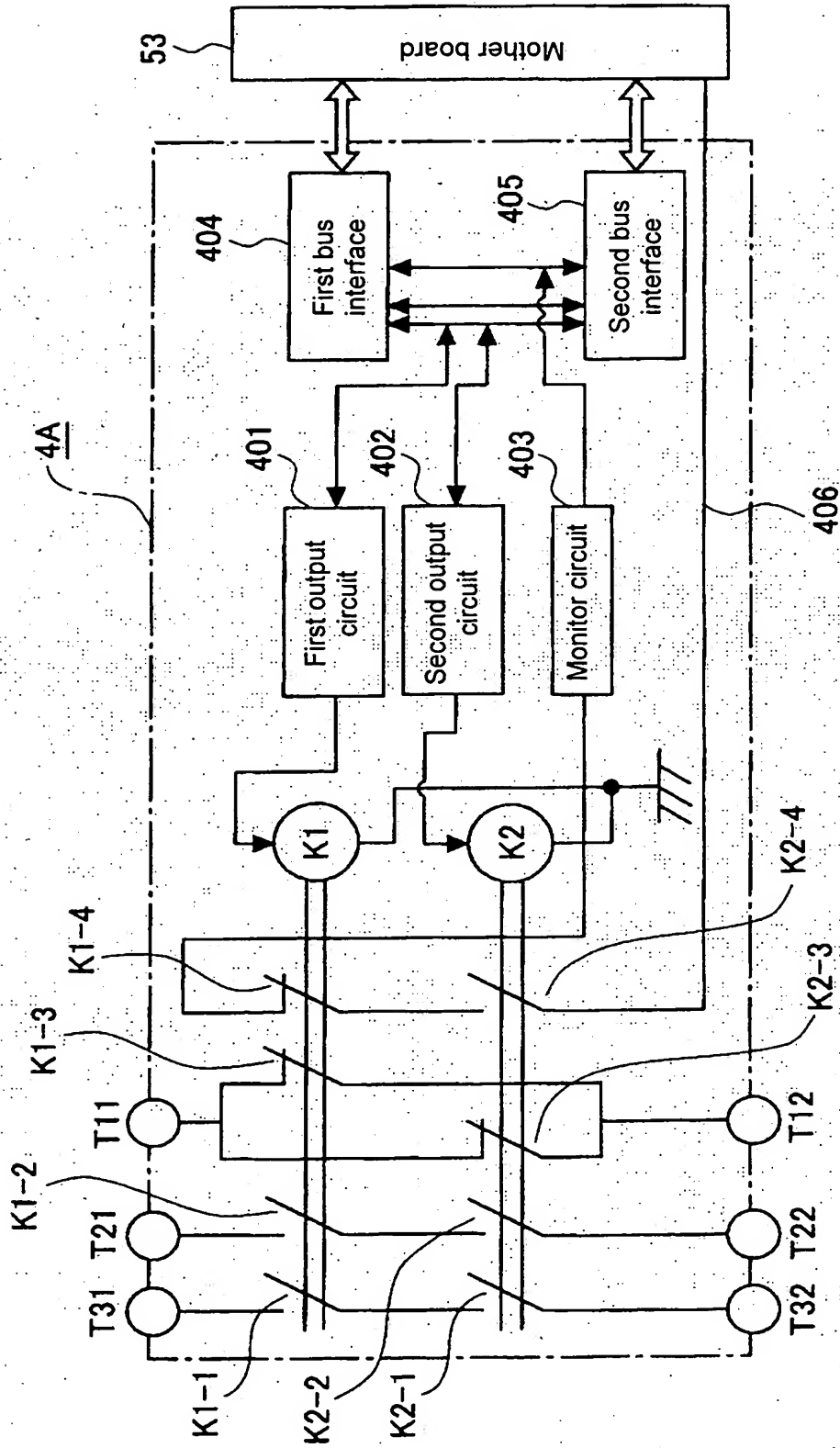
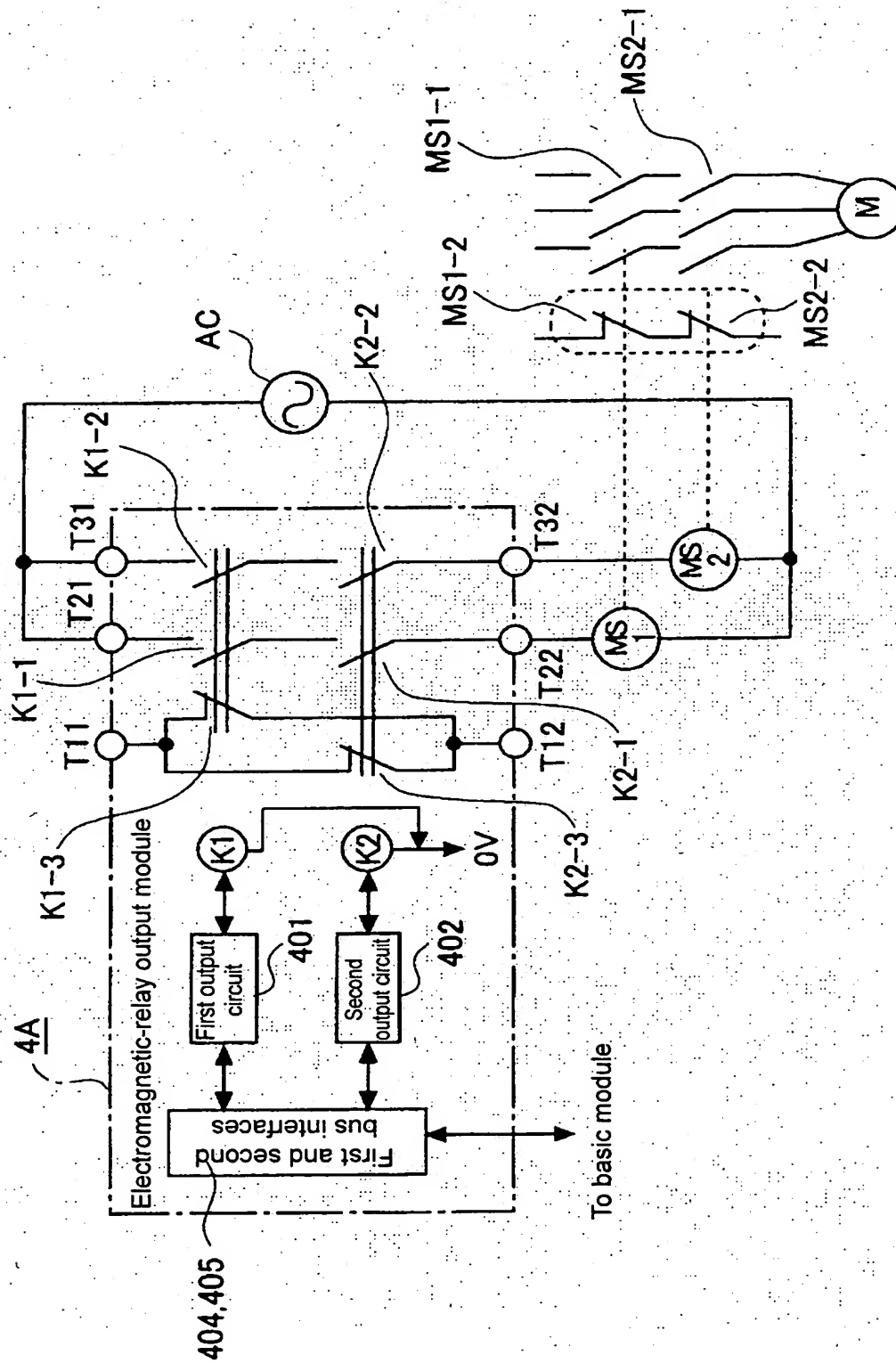


Fig. 7

**Fig. 8**





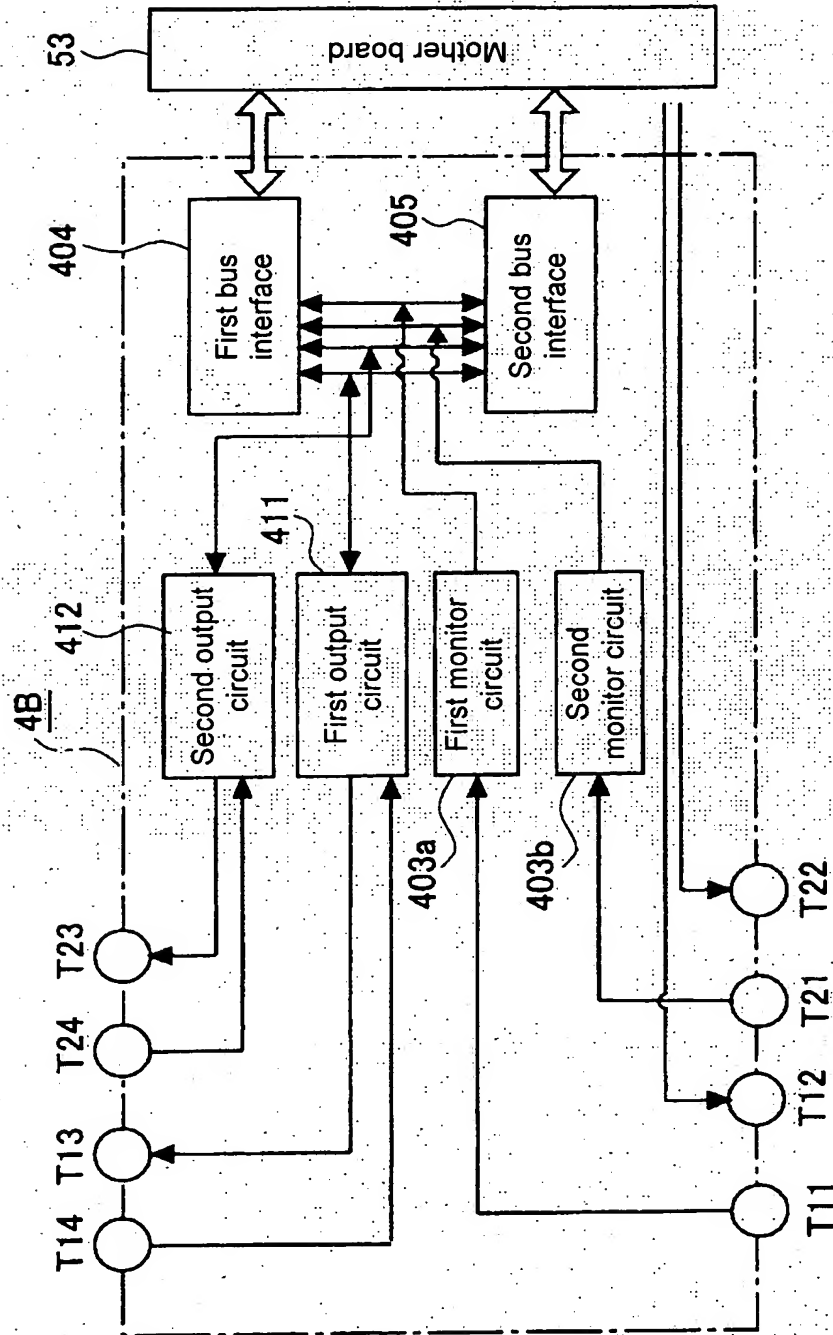


Fig. 9

Fig. 10

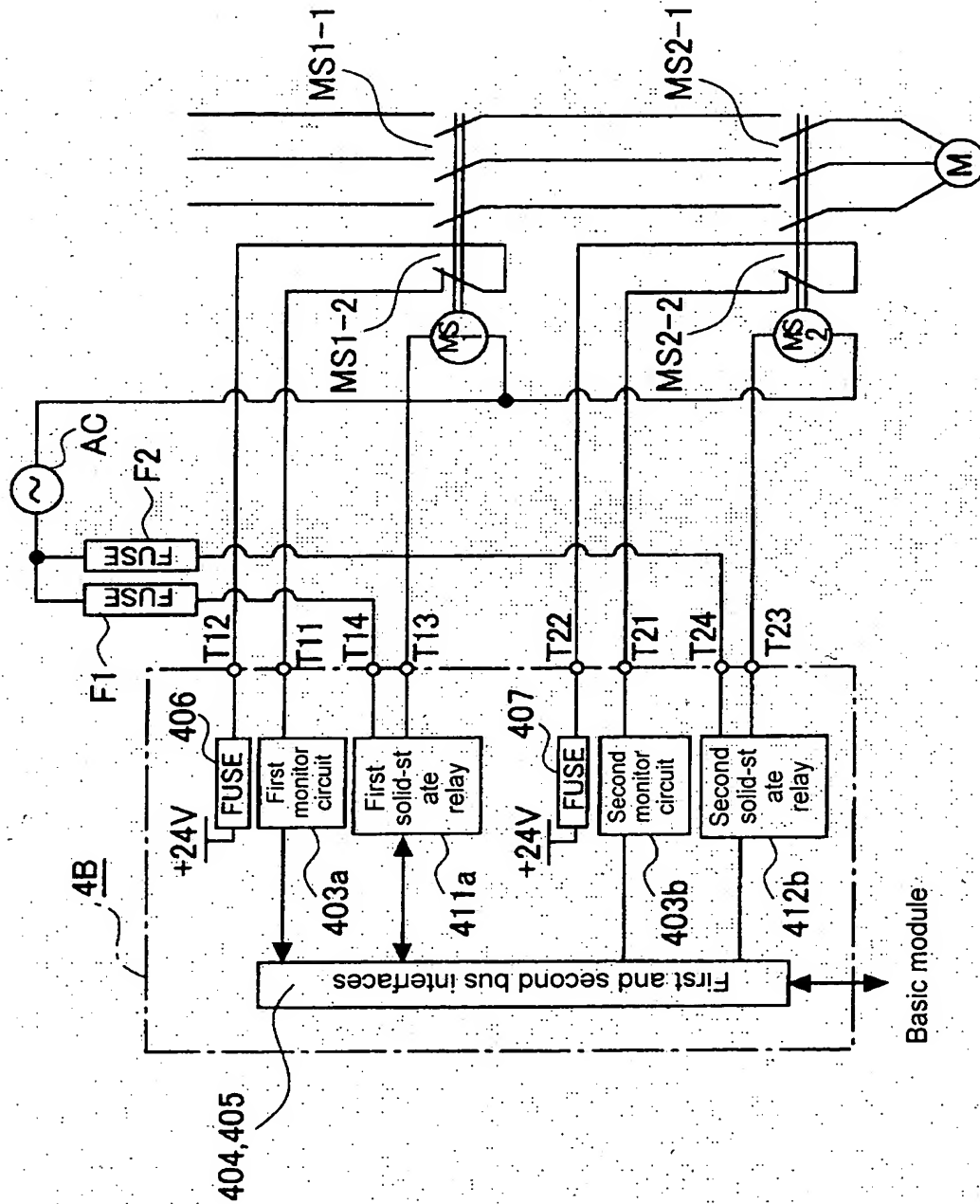


Fig. 11

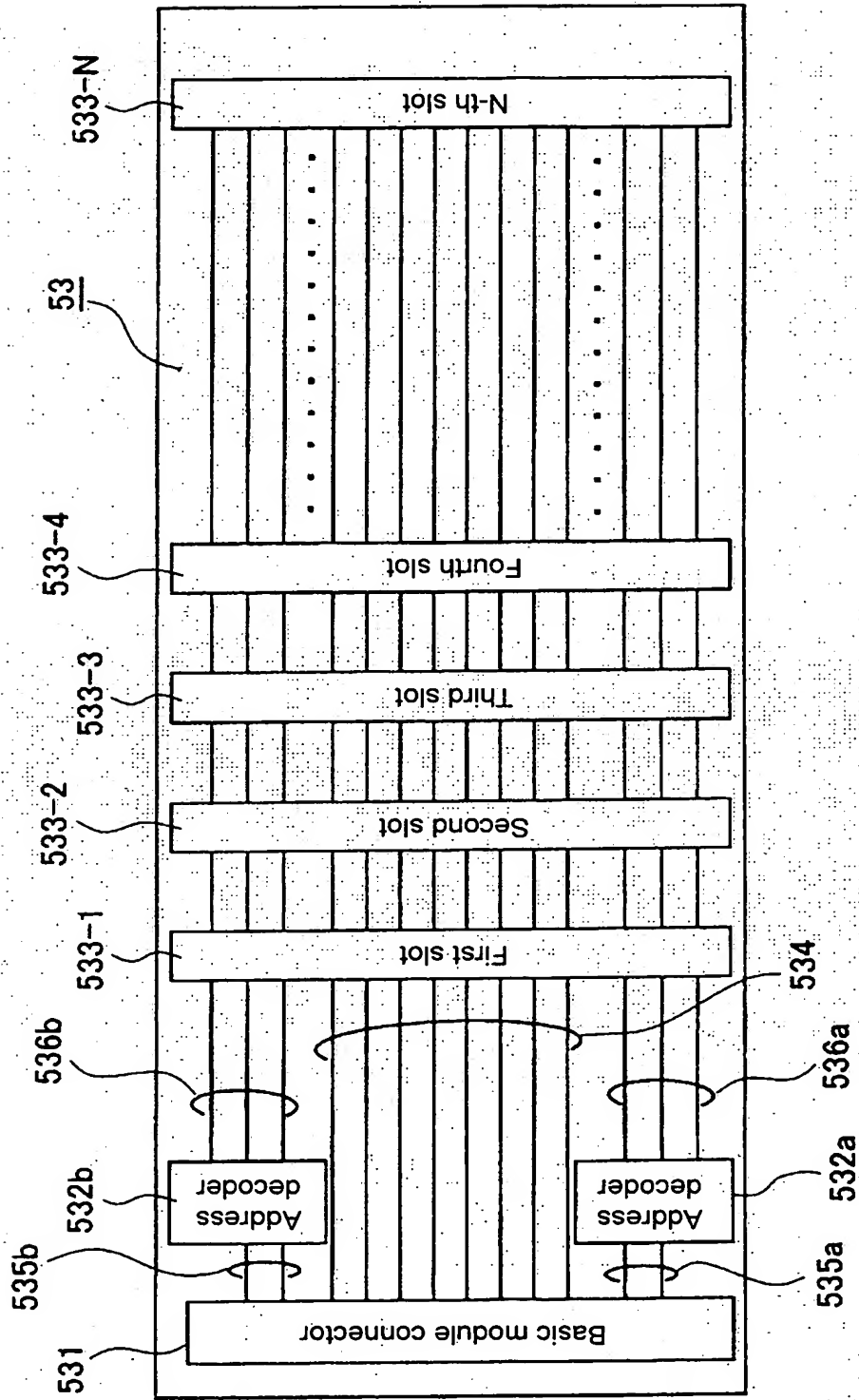


Fig. 12

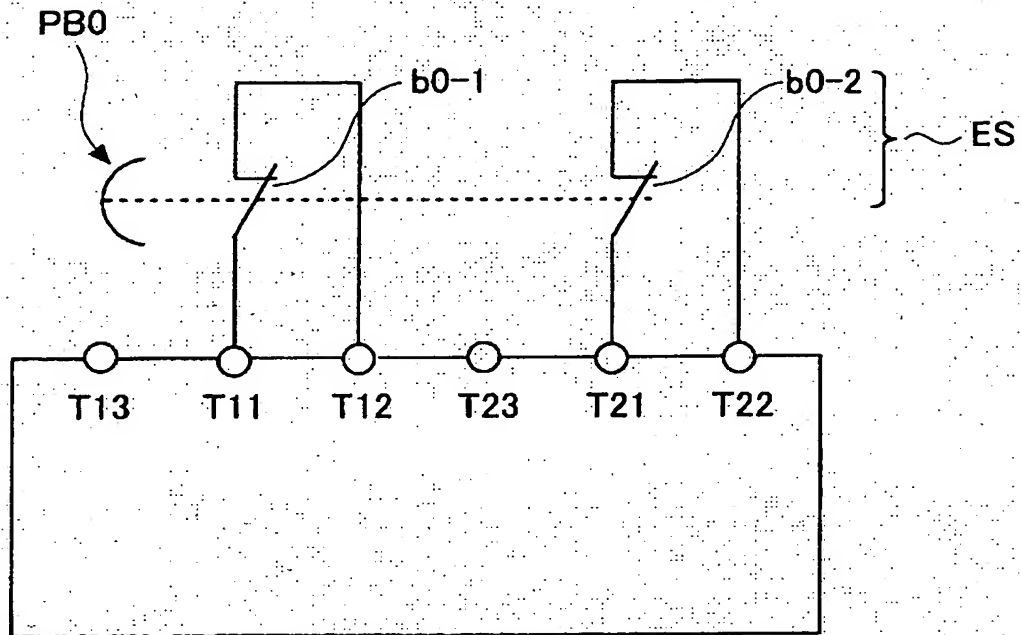


Fig. 13

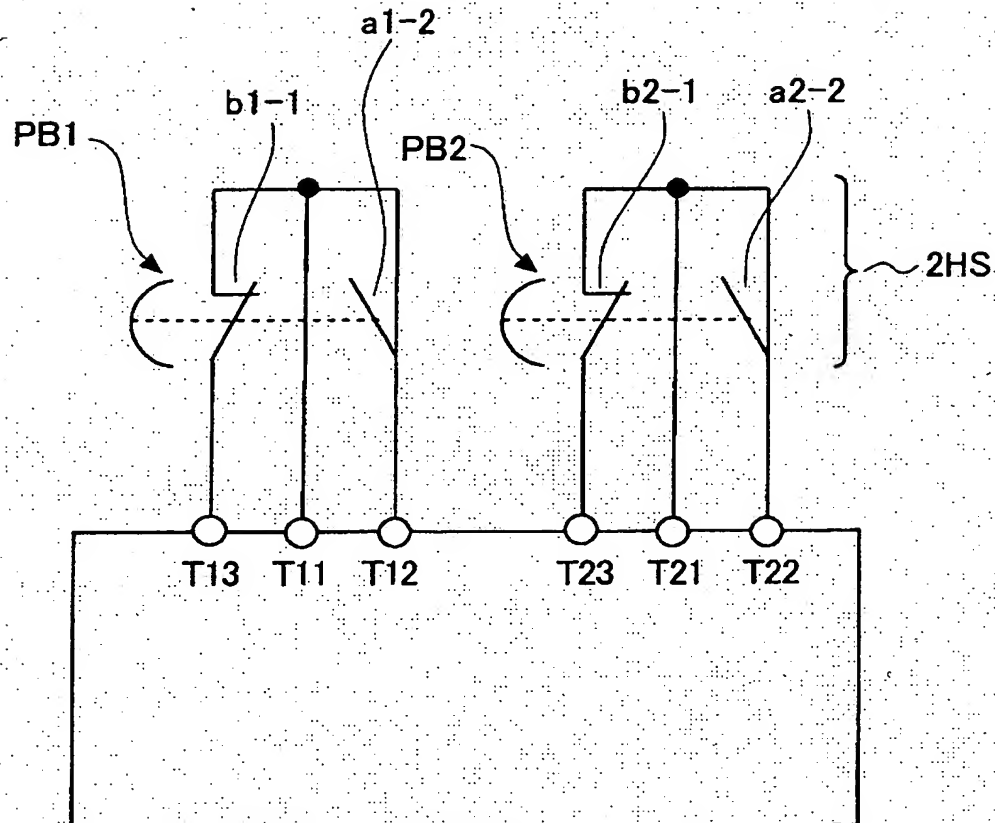


Fig. 14

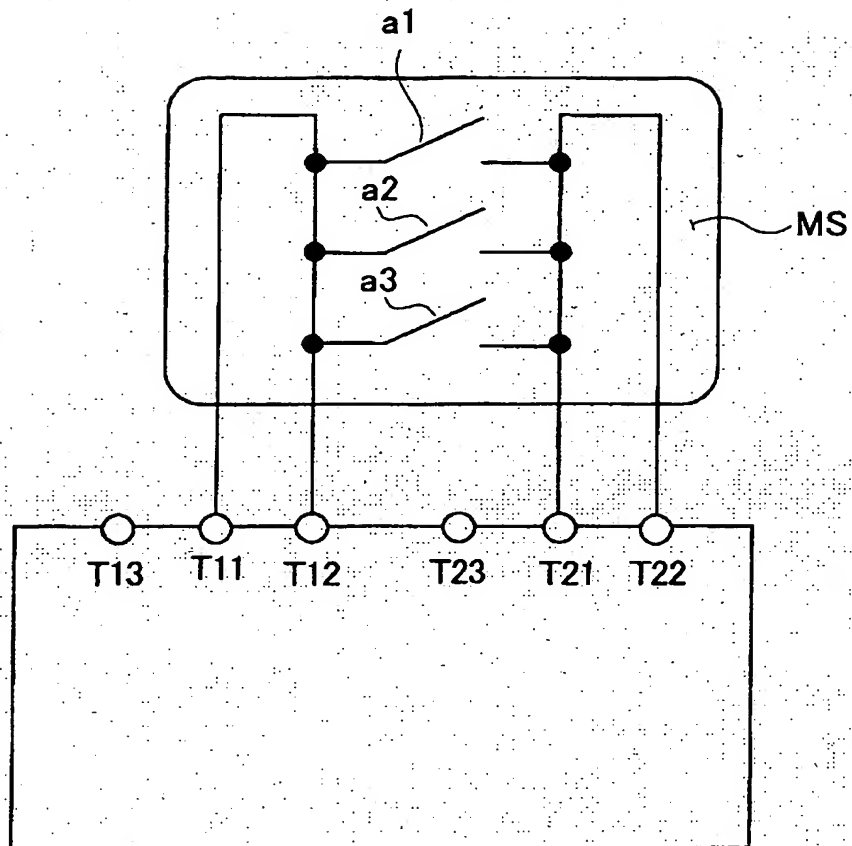


Fig. 15

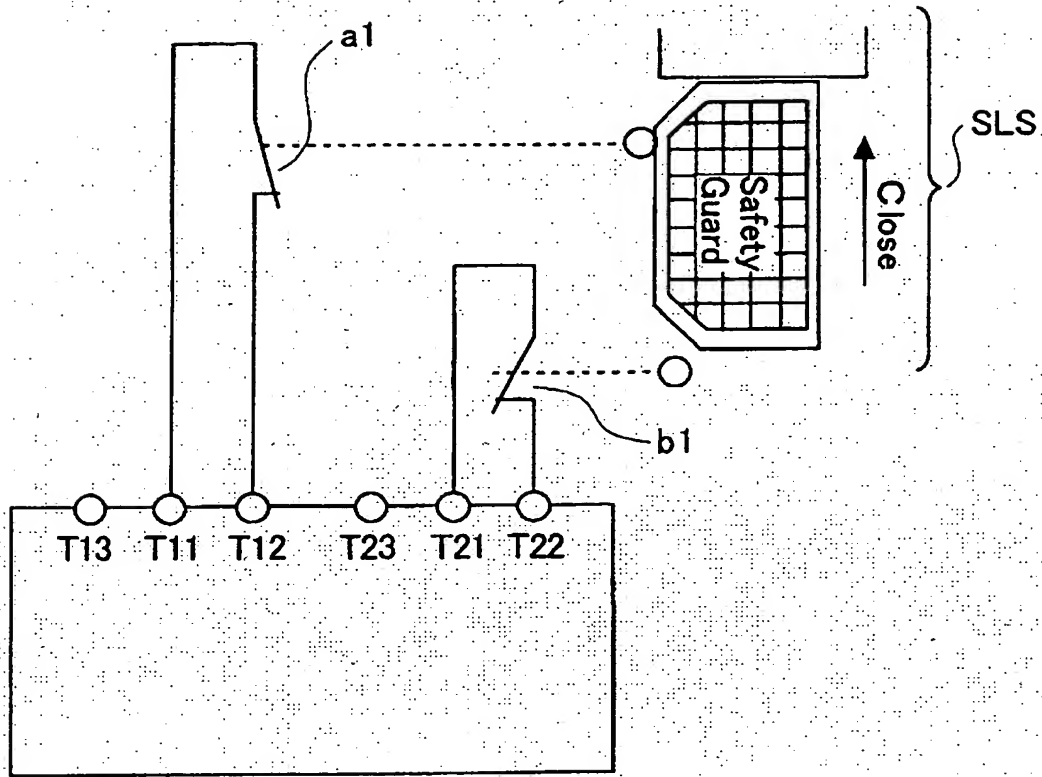


Fig. 16

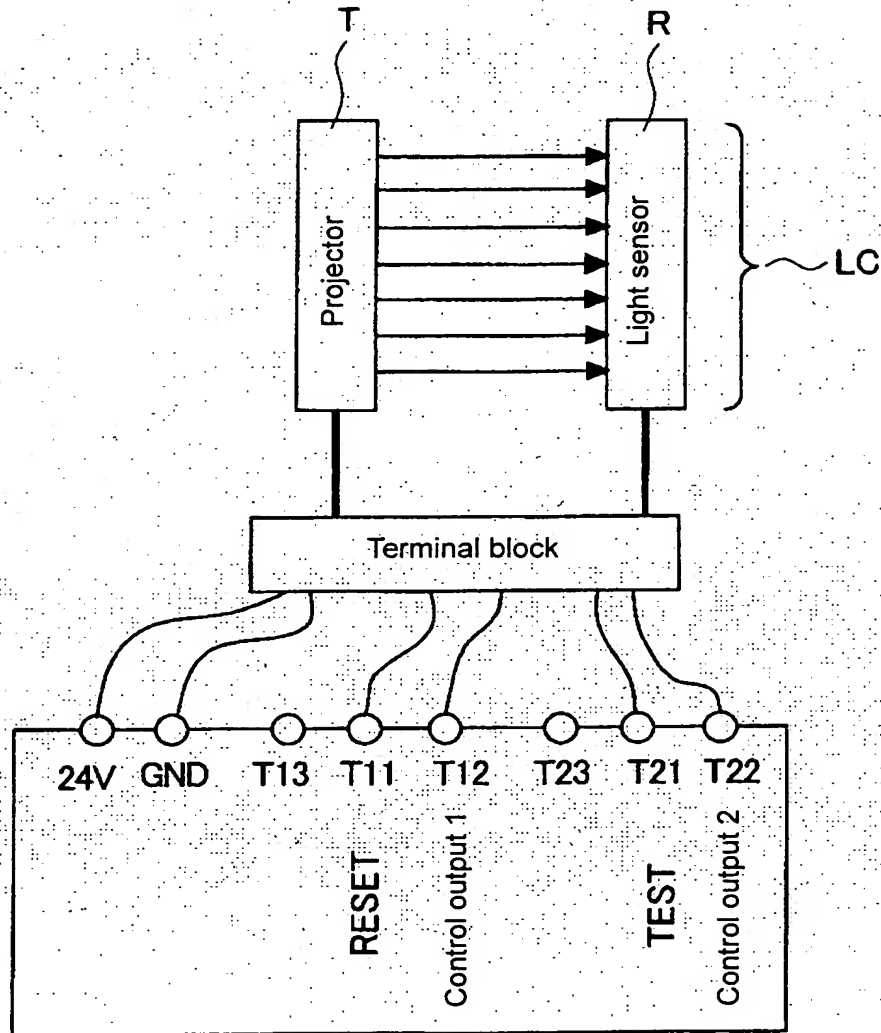




Fig. 17

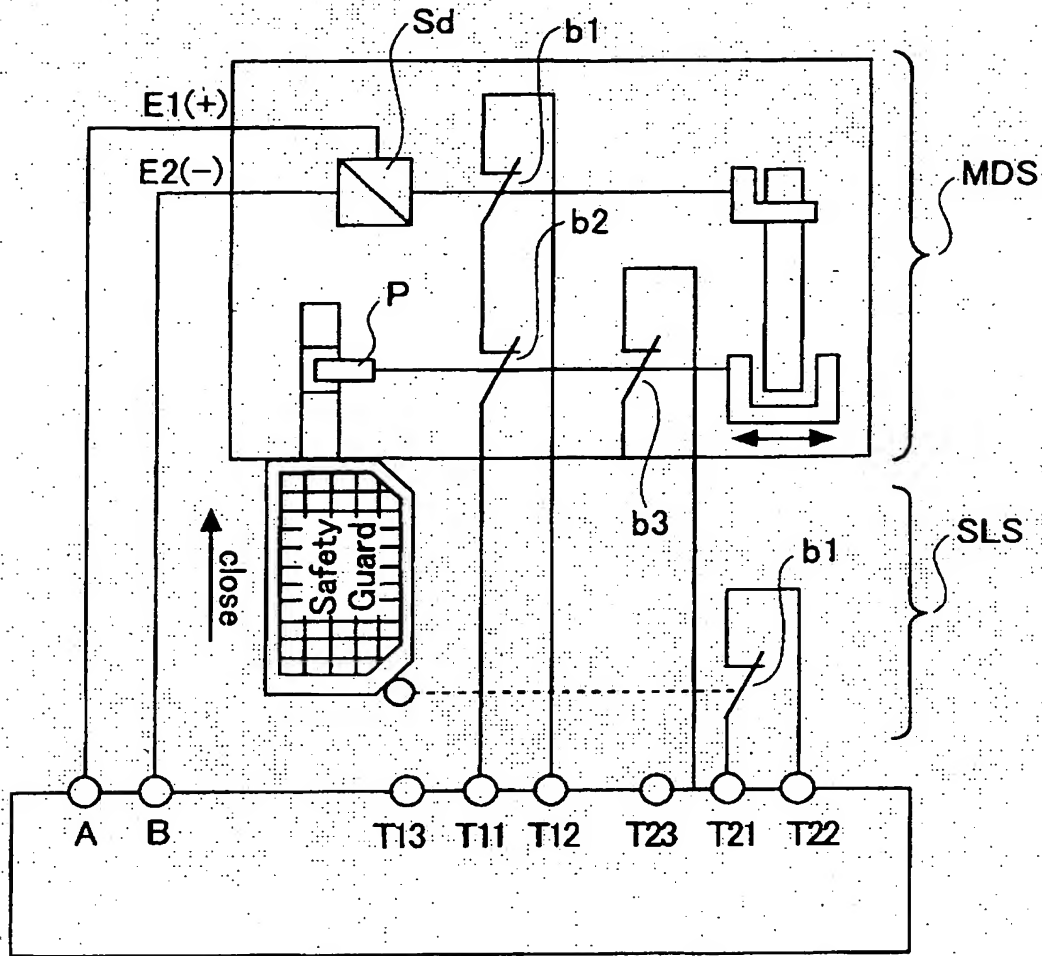


Fig. 18

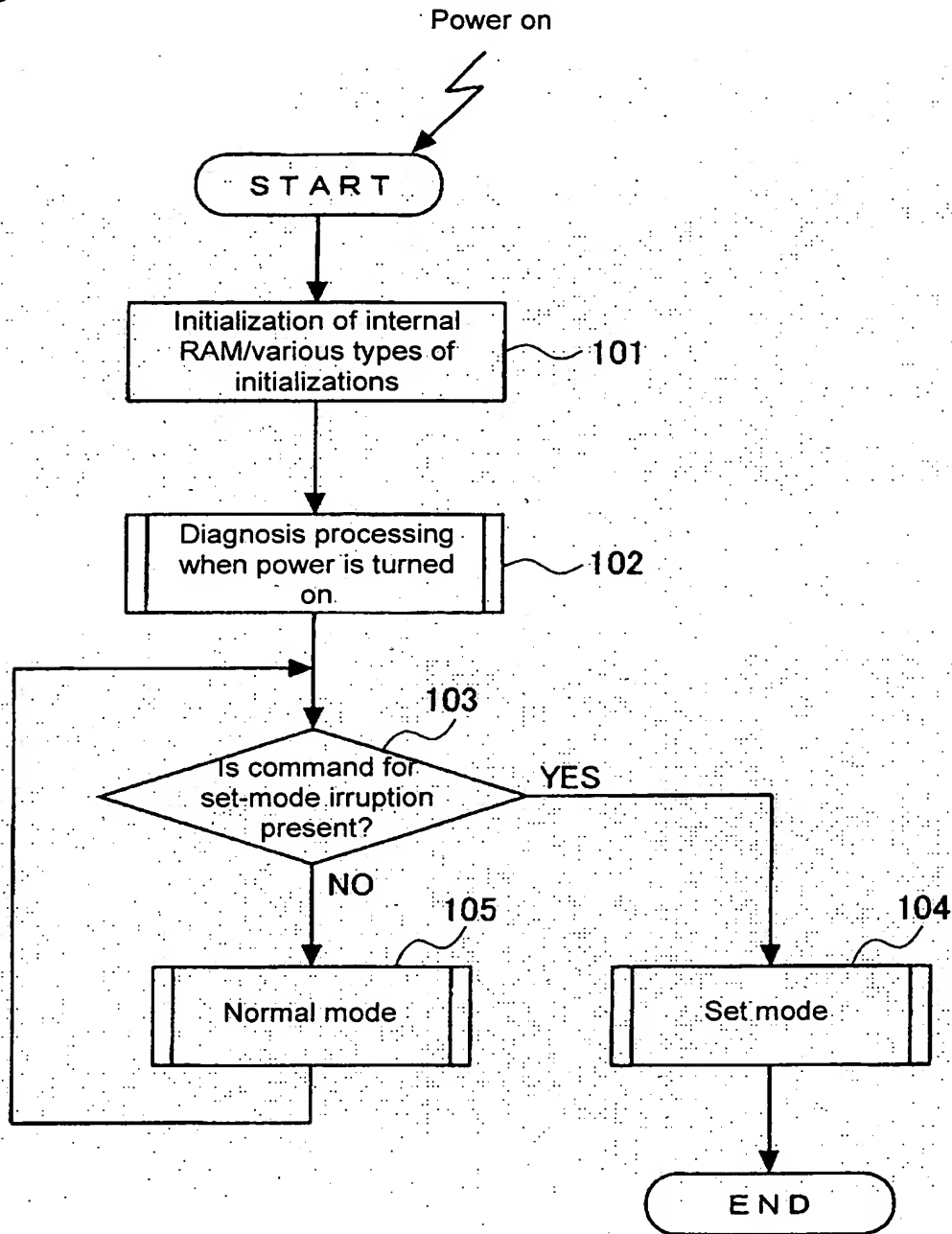


Fig. 19

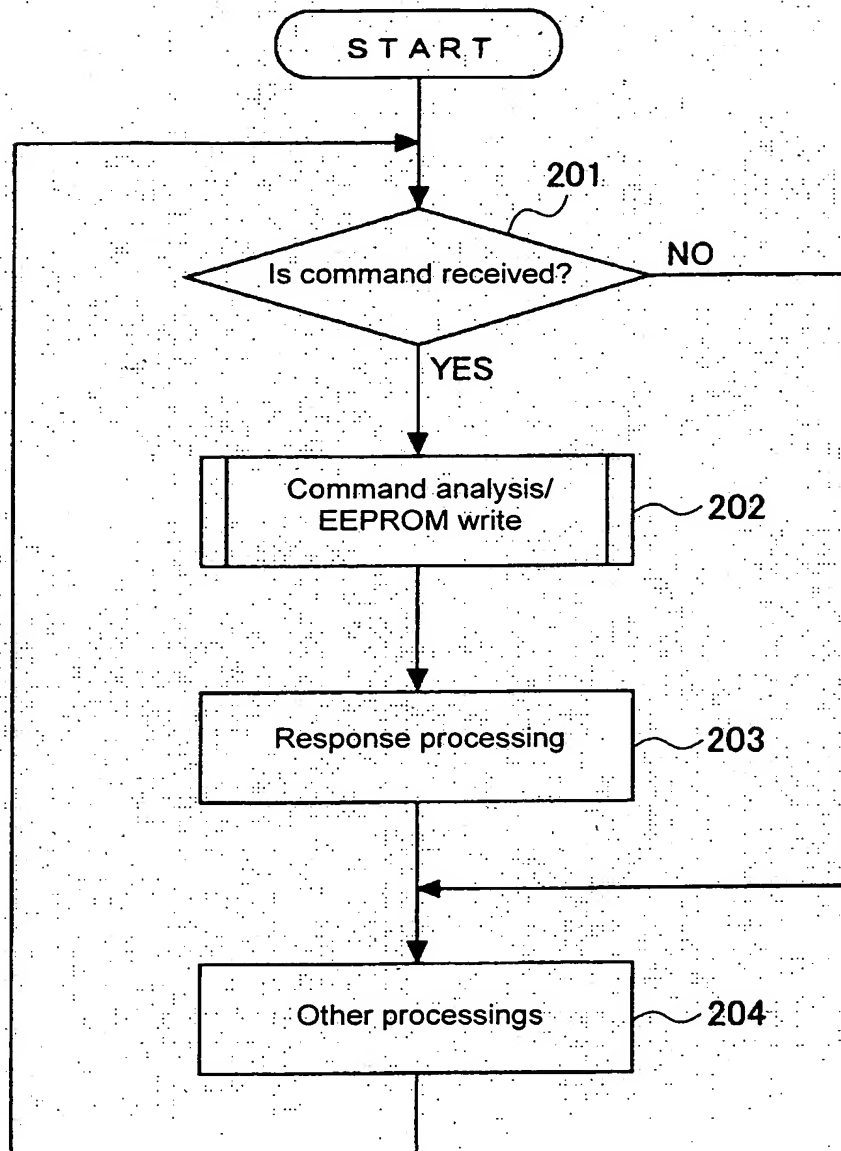


Fig. 20

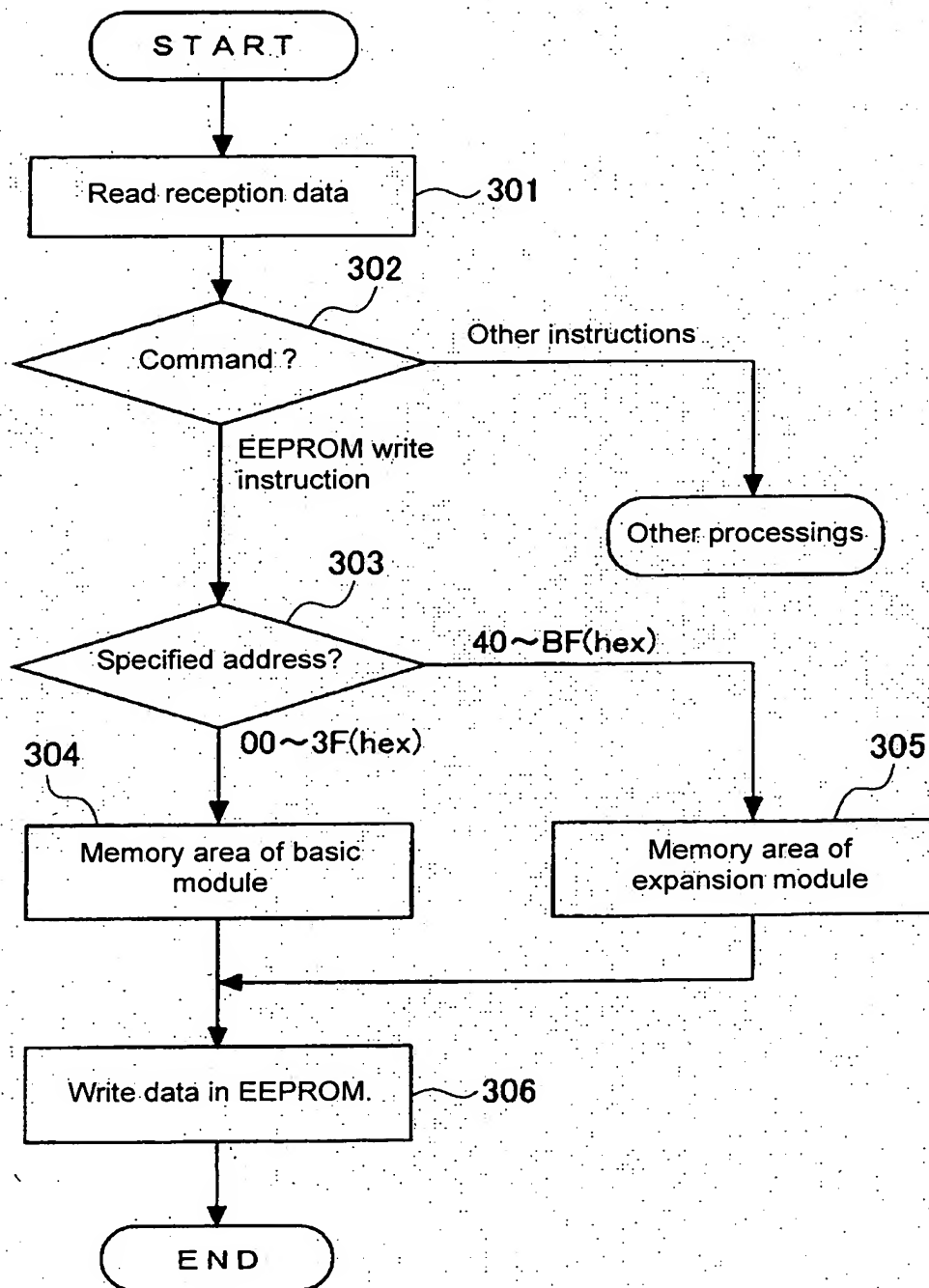


Fig. 21

Type	Address	Bytes	Data	Value range
Common specification setting, Basic module setting	0	2	CRC	0~FFFFh
	2	30	Delay time table	0~300
	20	1	( reserve )	
	21	1	Daly mode	0 : Off-ready 1 : On-ready
	22	2	Delay time	0~300
	24	1	Main module: Operation mode	0 : 2N.C (Emergency stop switch or the like) 1 : 1N.C + 1N.O 2 : Two-hand switch 3 : Mat switch 4 : Light curtain
	25	1	( reserve )	
	26	30	Digital filter value	1~255
	30	1	Allowance of time difference between safety input systems	0: Infinite, 1 - 255
	31	1	Maximum time of manual reset on	0: Infinite, 1 - 255
Expansion module setting	32	8	Format data	
	3A	2	( reserve )	
	3C	4	Hardware version	0.00~99.99
	40	16	Connection module 1	
	50	16	Connection module 2	
	60	16	Connection module 3	
	70	16	Connection module 4	
	80	16	Connection module 5	
	90	16	Connection module 6	
	A0	16	Connection module 7	
	B0	16	Connection module 8	

Fig. 22

Type	Address	Bytes	Data	Value range
Expansion input module	0	1	Module ID	00H : No connection 11H : Input module 12H : Input module 1 for specific switch 13H : Input module 2 for specific switch 14H : Input module 3 for specific switch ...
	1	1	Operation mode	0 : Emergency stop 1 : Emergency stop + Input 1 reversal 2 : Two hands 3 : Mat 4 : Light curtain
	2	1	Allowance of time difference between safety input systems	0: Infinite, 1 - 255
	3	1	( reserve )	
	4	2	Digital filter value	1~255
	6	1	Operation mode	0 : Emergency stop 1 : Emergency stop + Input 1 reversal 2 : Two hands 3 : Mat 4 : Light curtain
	7	1	Allowance of time difference between safety input systems	0: Infinite, 1 - 255
	8	1	( reserve )	
	9	2	Digital filter value	1~255
	B	1	( reserve )	
	C	4	Hardware version	0.00 ~ 99.99

Fig. 23

Type	Address	Bytes	Data	Value range
Expansion output module	0	1	Module ID	00H : No connection 01H : AC semiconductor output module 02H : Relay output module
	1	1	Delay mode	0 : Off-ready 1 : On-ready
	2	2	Delay time	0~300
	4	8	(reserve)	
	C	4	Hardware version	0.00~99.99

Fig. 24

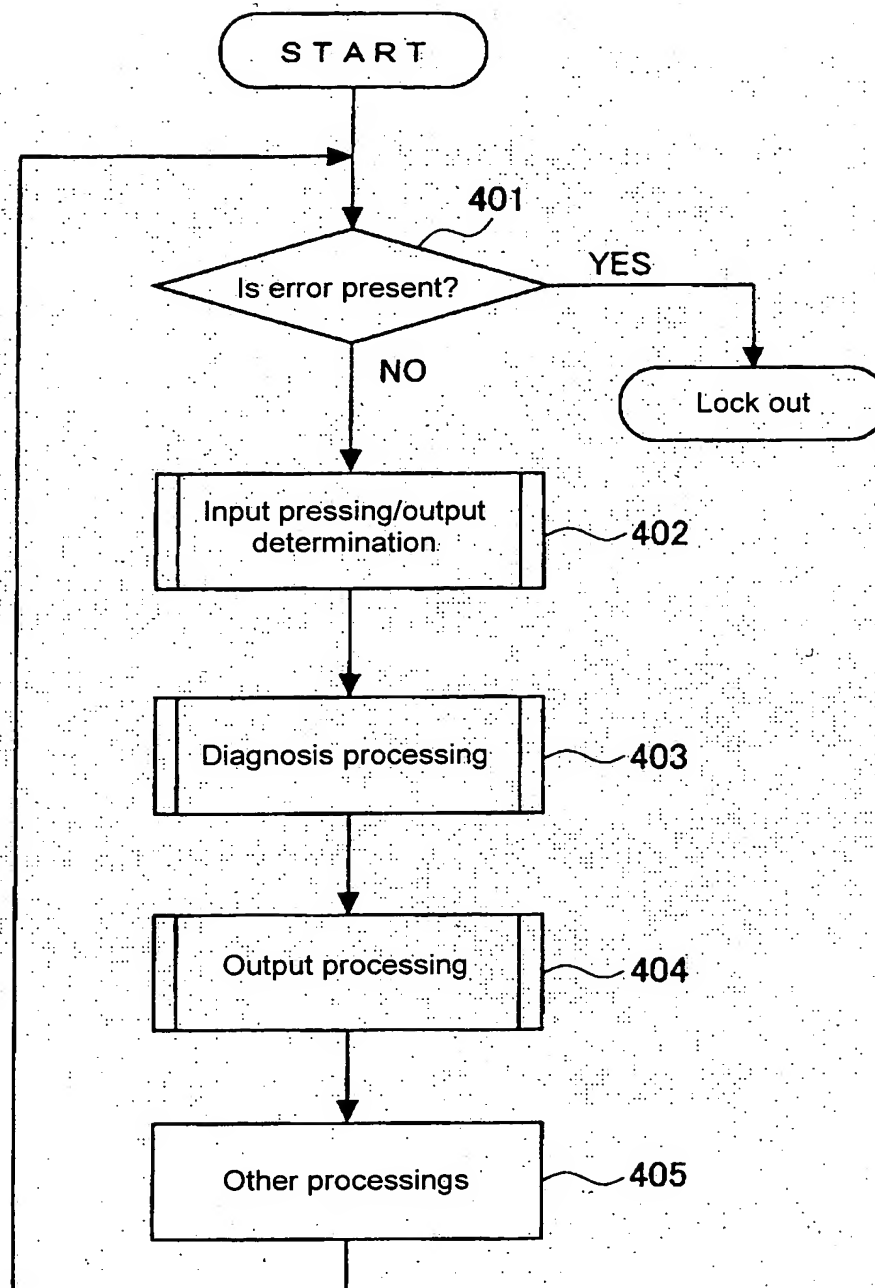




Fig. 25

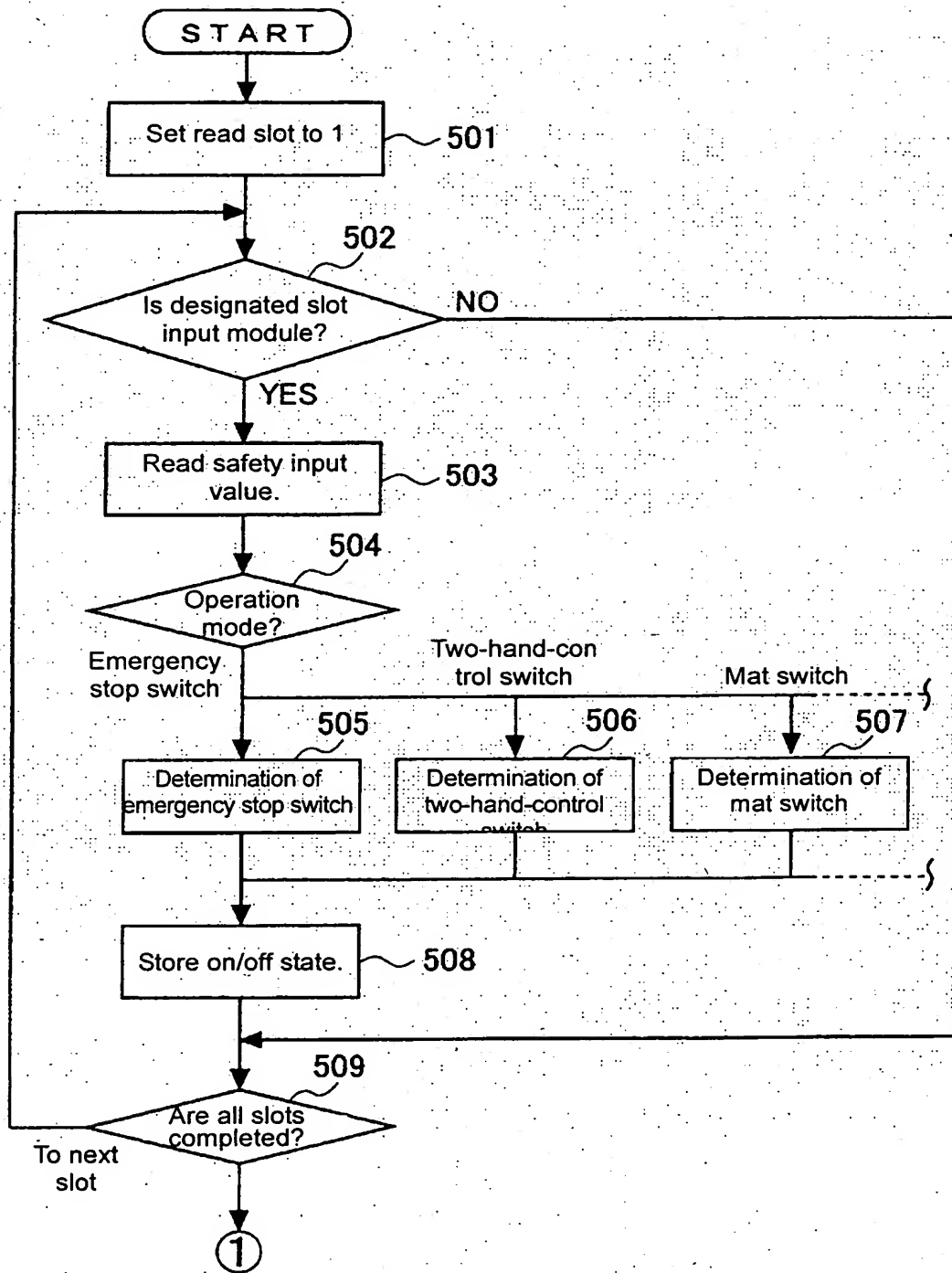


Fig. 26

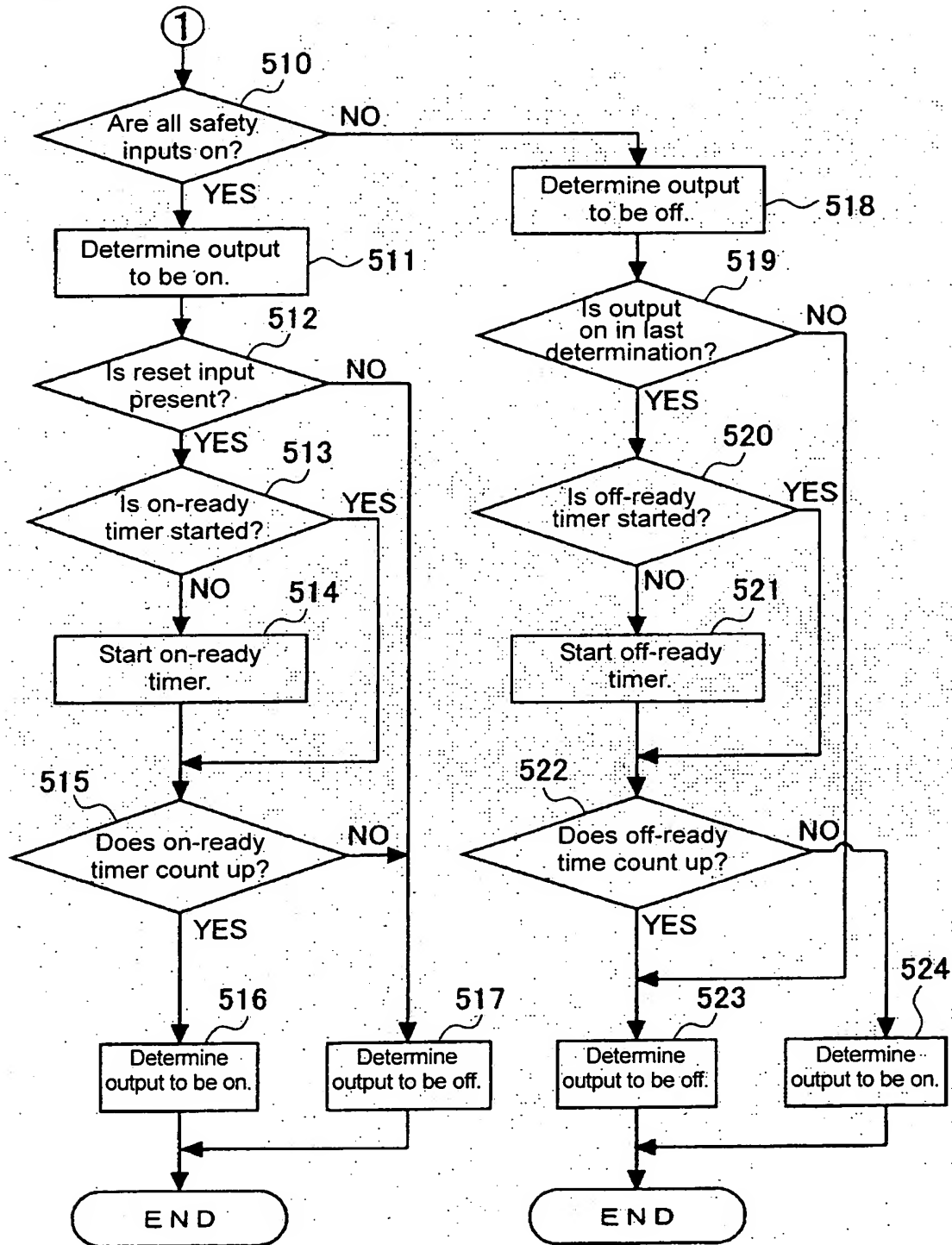


Fig. 27

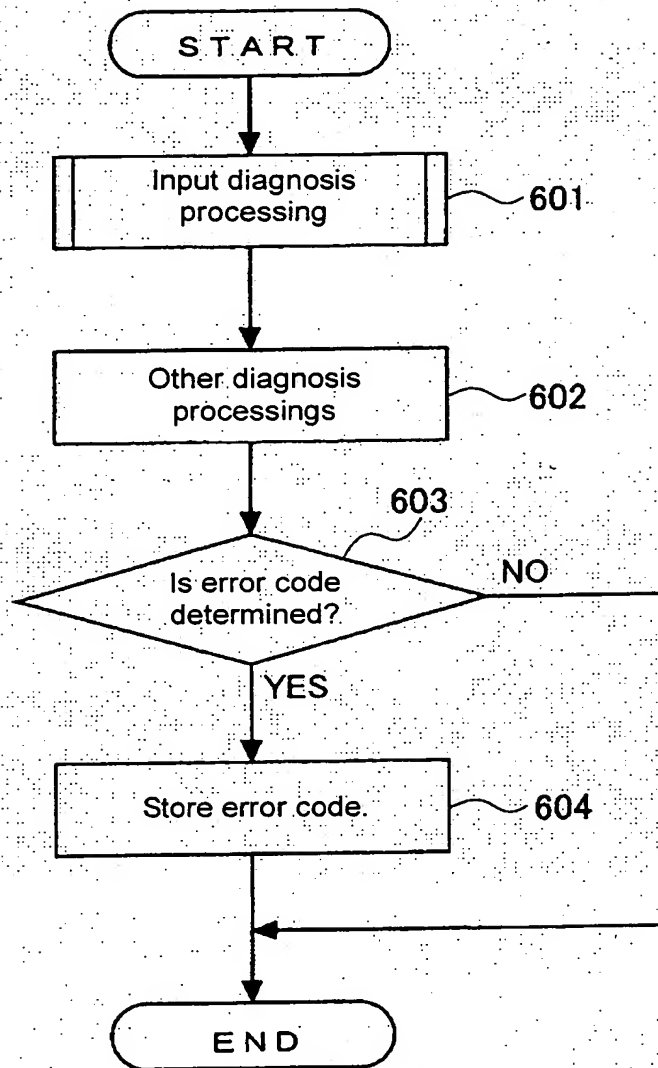


Fig. 28

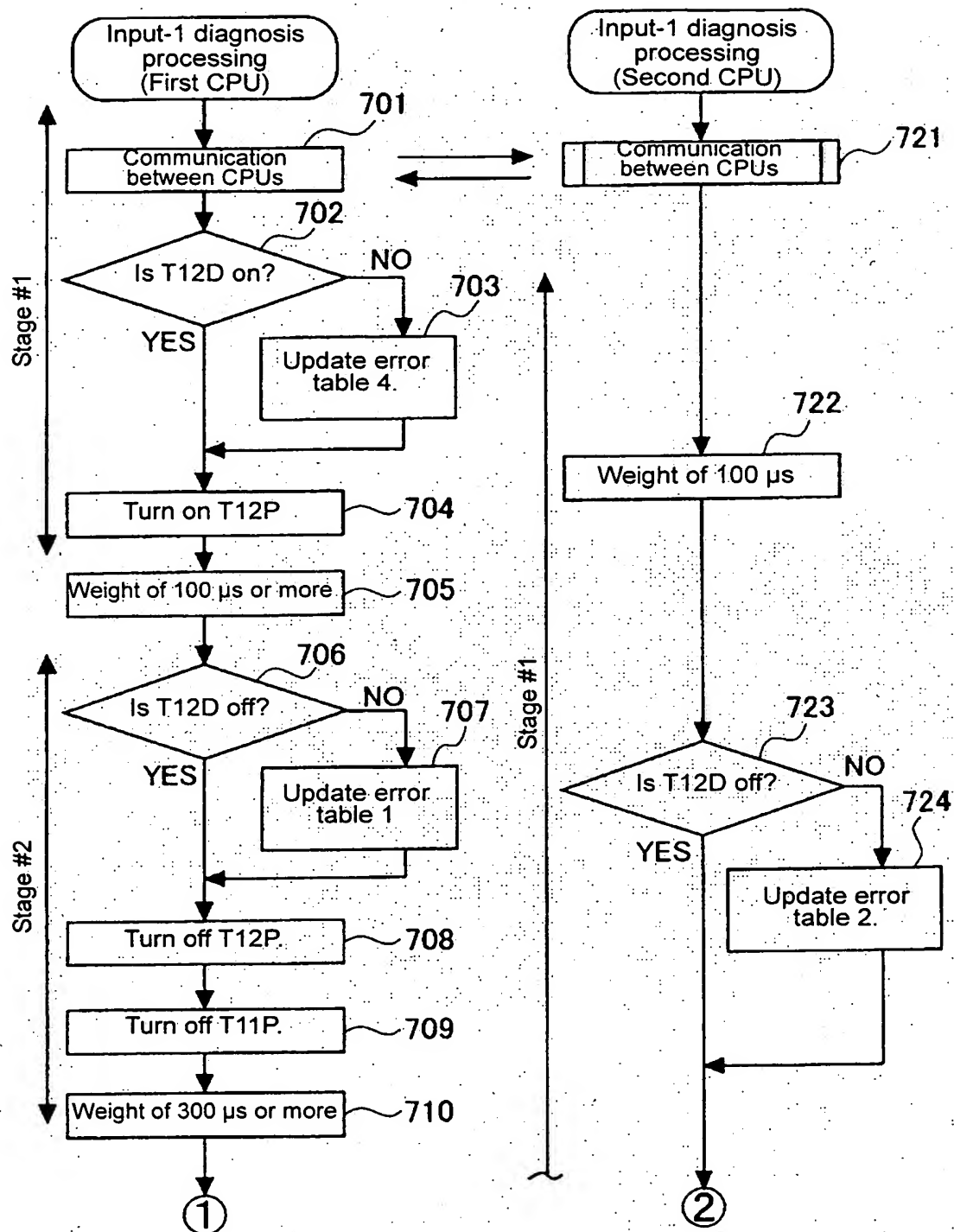


Fig. 29

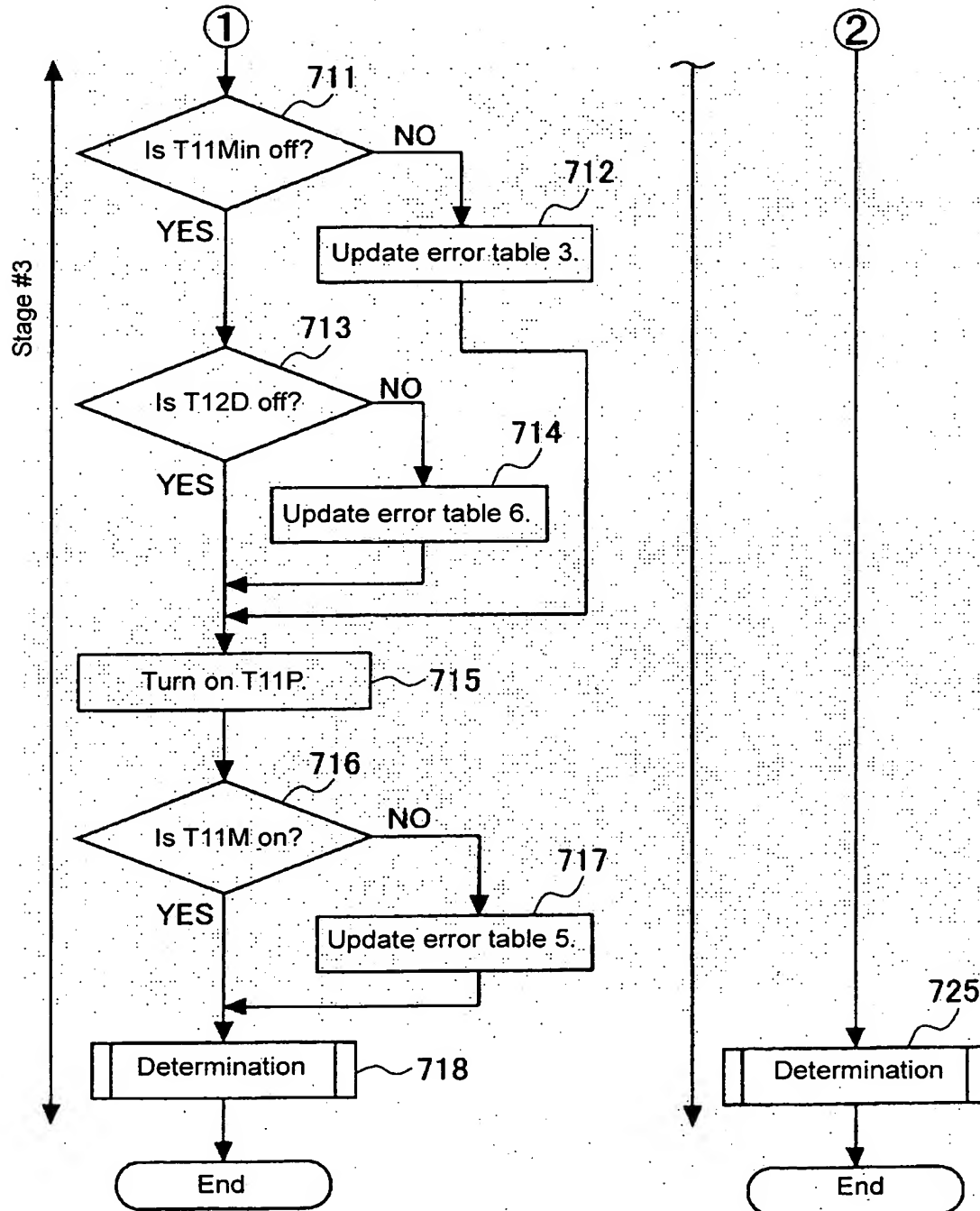


Fig. 30

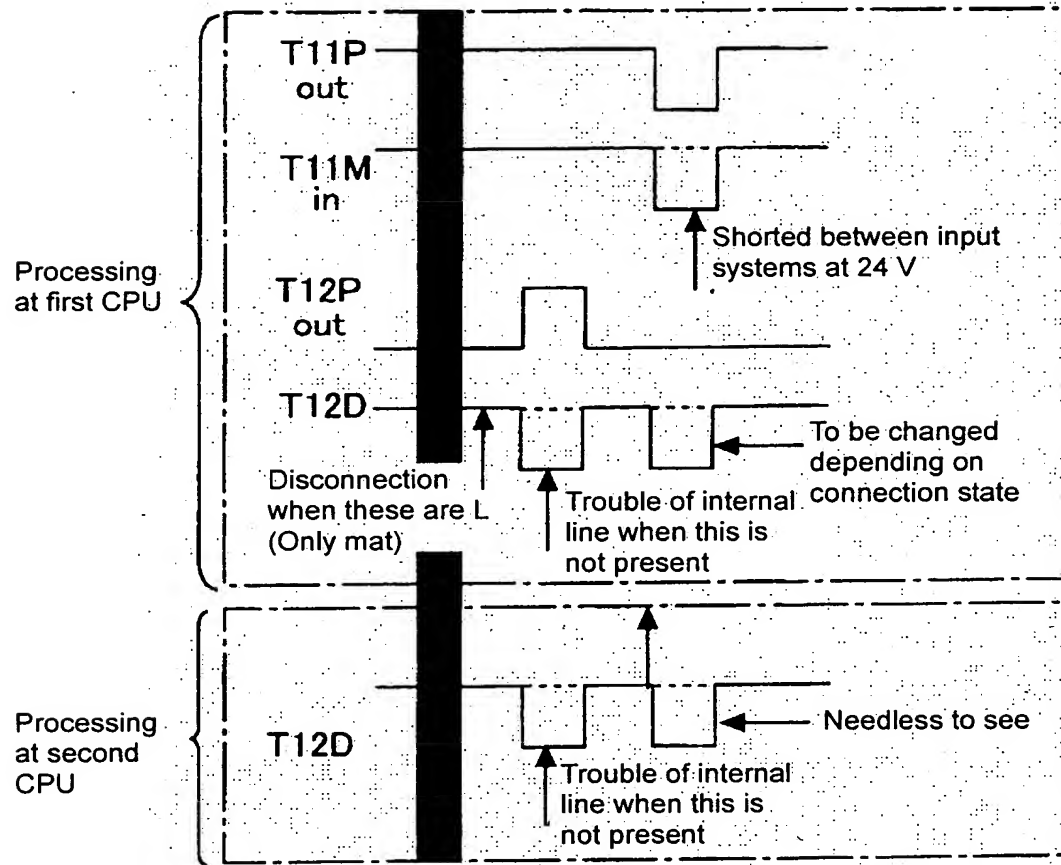


Fig. 31

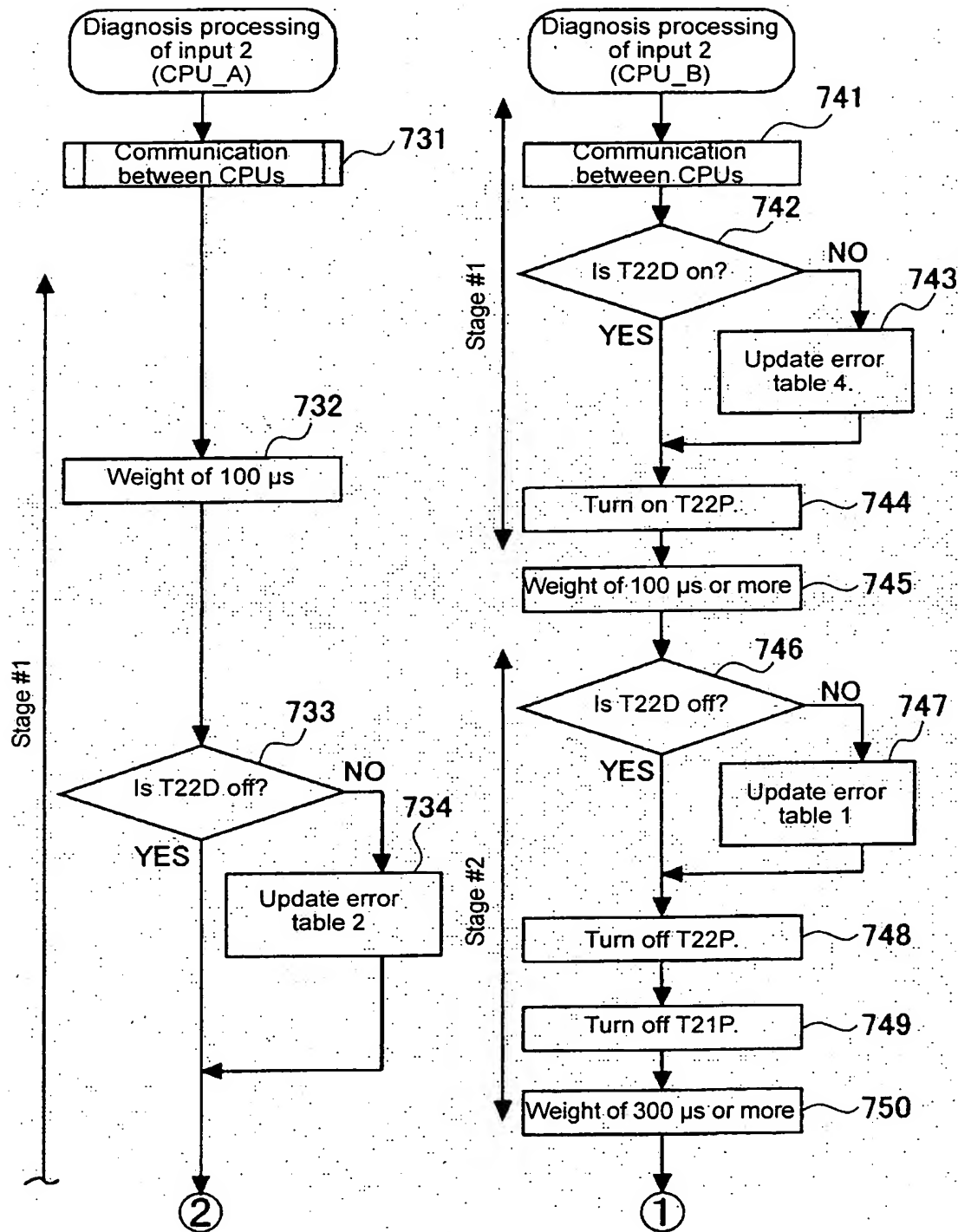


Fig. 32

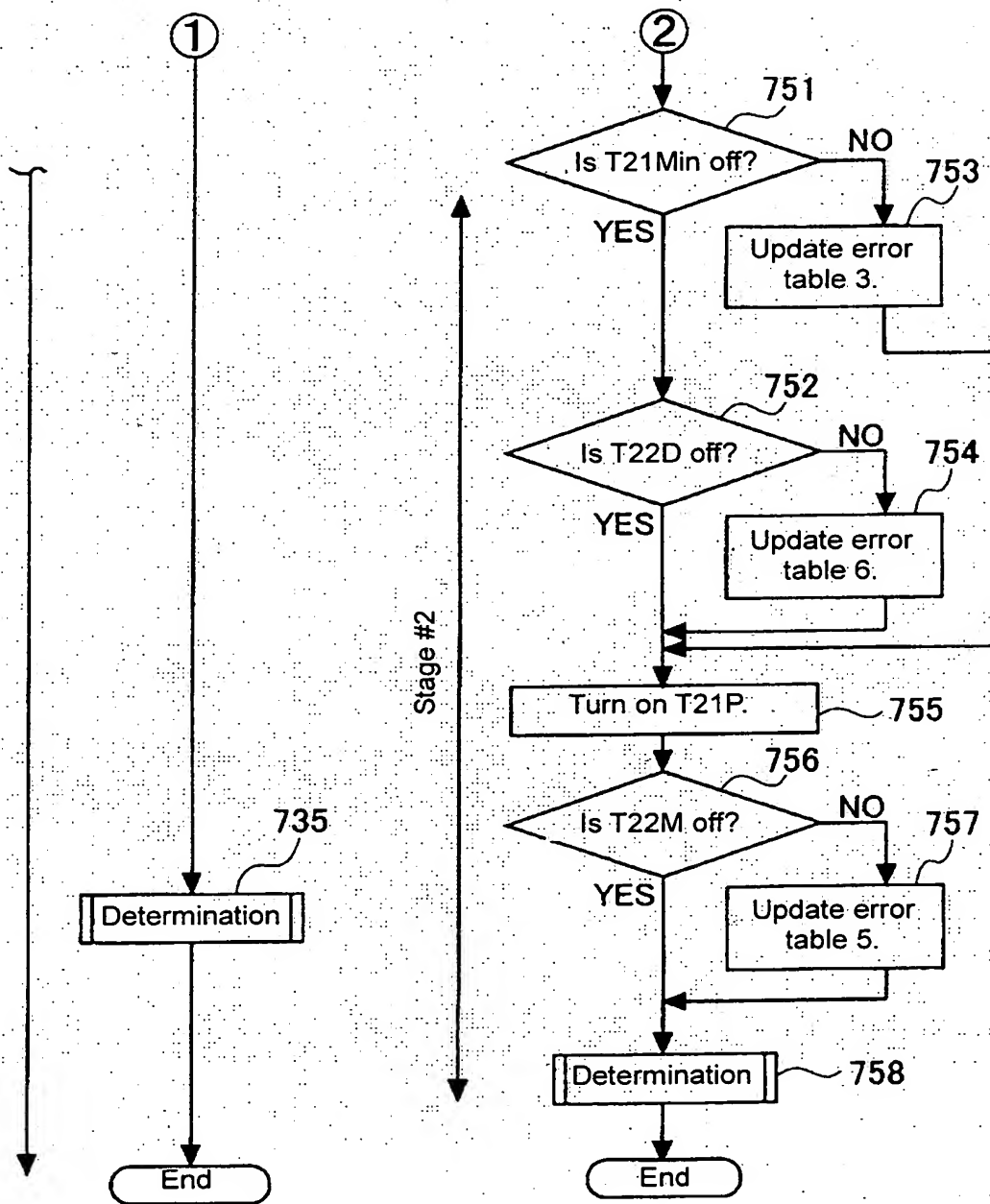




Fig. 33

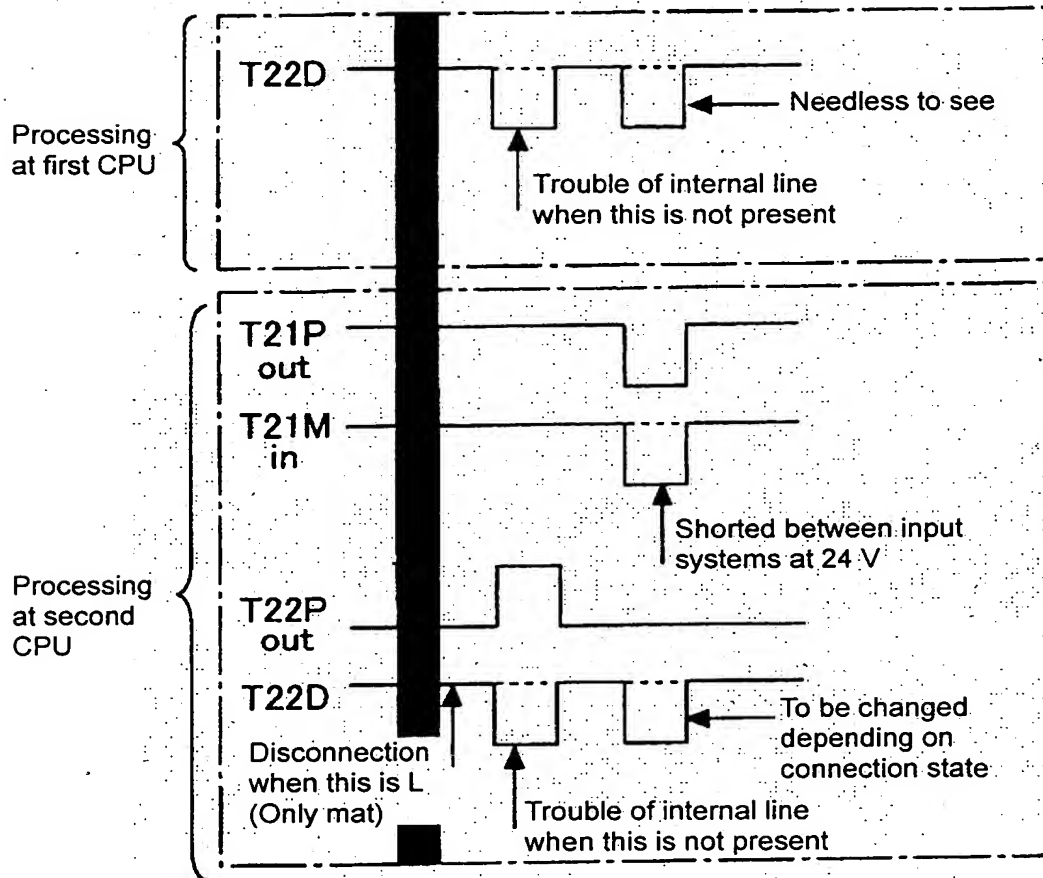


Fig. 34

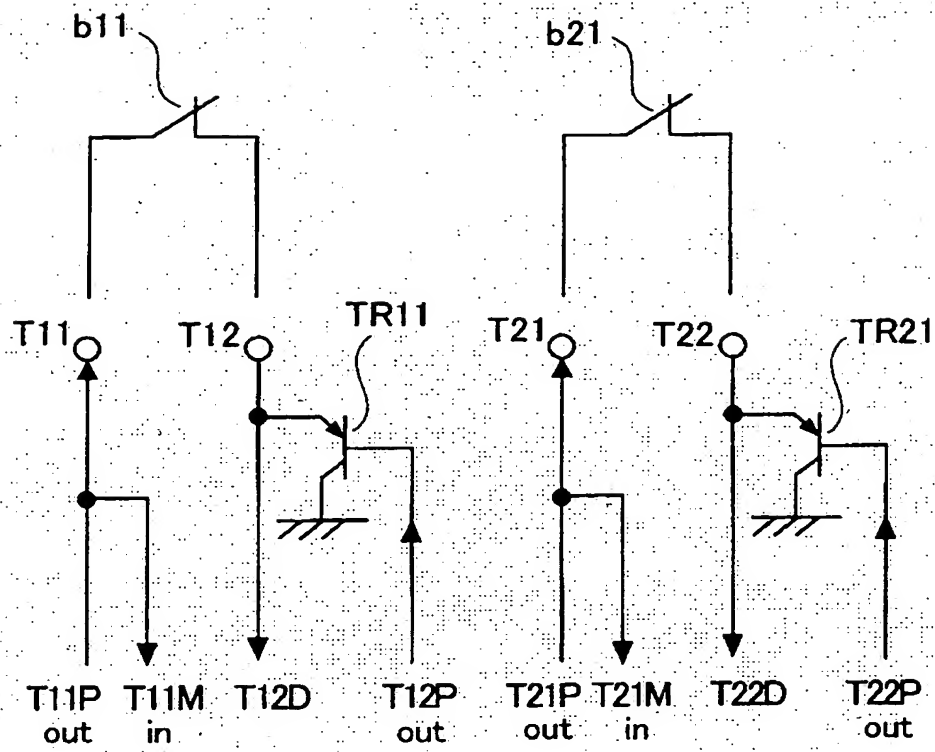


Fig. 35

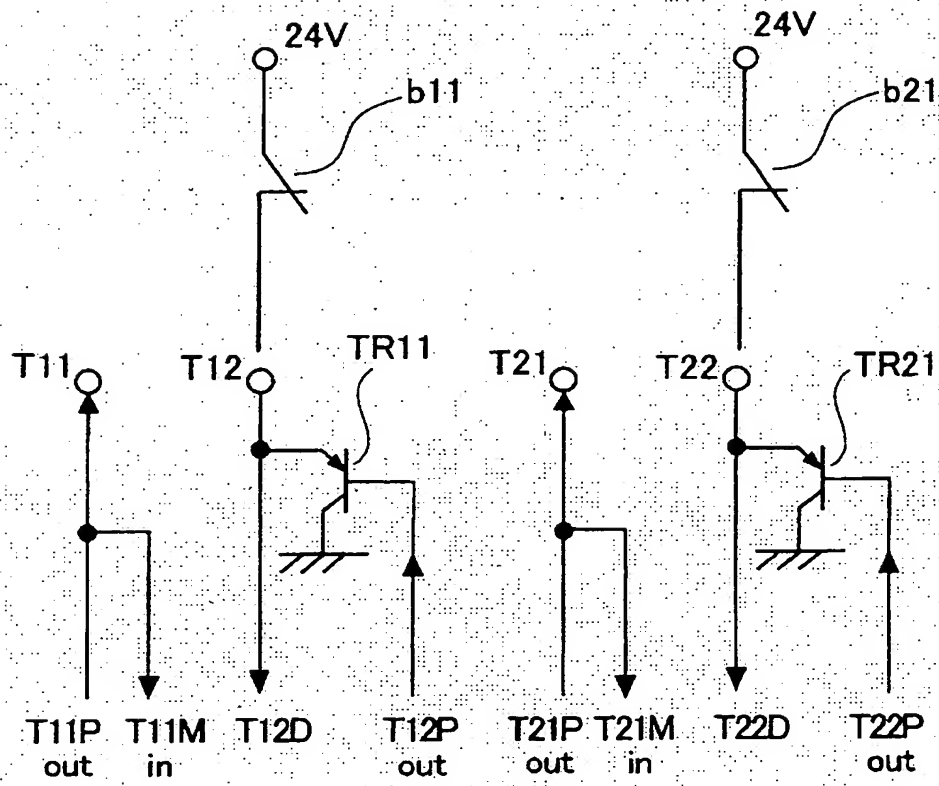


Fig. 36

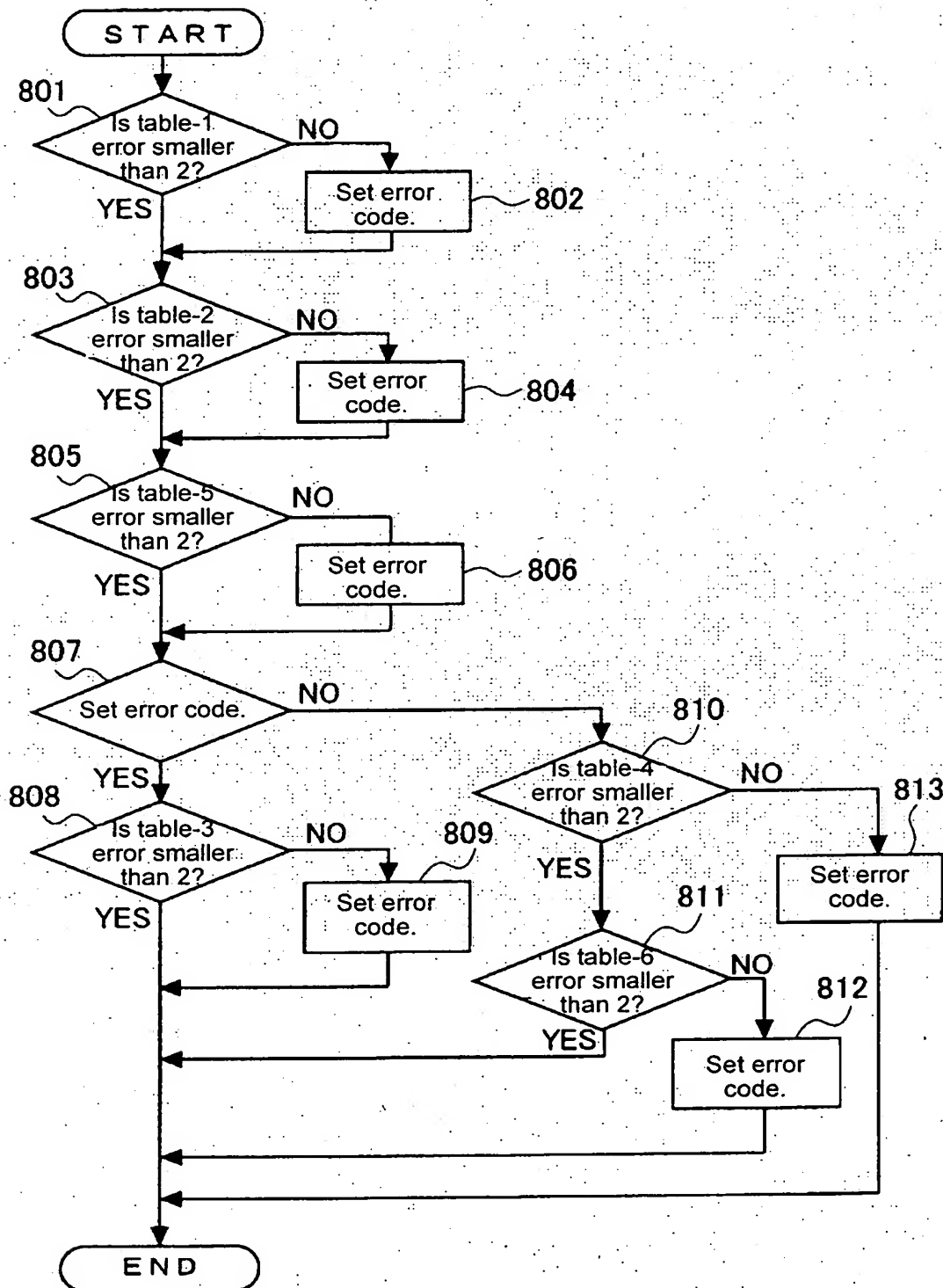


Fig. 37

Input	Mode 1 byte	Diagnosis result				Reference 1 byte	Remarks
		Trouble of self-input section of table 1 2 byte	Trouble of other input section of table 2 2 byte	Short between safety inputs of table 3 2 byte	Disconnec- tion of tables 4 and 6 2 byte	Trouble of monitor circuit of table 5 2 byte	
Basic	0	-1	-1	-1	1	-1	2
Expansion 1	2	-1	-1	-1	9	-1	2
Expansion 2	3	-1	-1	9	-1	-1	2
.							
.							
Expansion 8	-1						2

Modes: Modes stored in EEPROM  
0: Emergency stop  
1: Emergency stop + Input-1 active reversal  
2: Two hands  
3: Mat  
4: Light curtain  
-1: No connection

Results 0: Diagnosis unexecuted  
(Regularly cleared depending on system)  
-1: Normal end  
1: Trouble first time  
2: Trouble second time

Fig. 38

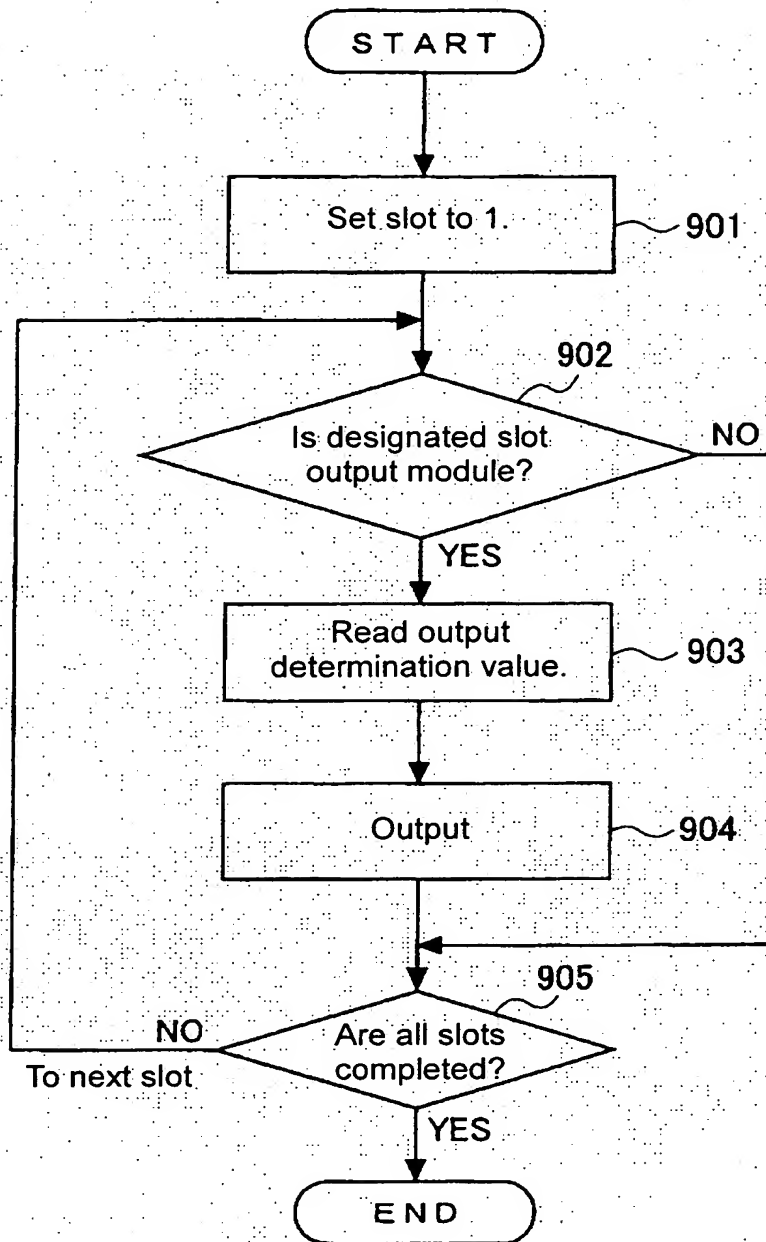


Fig. 39

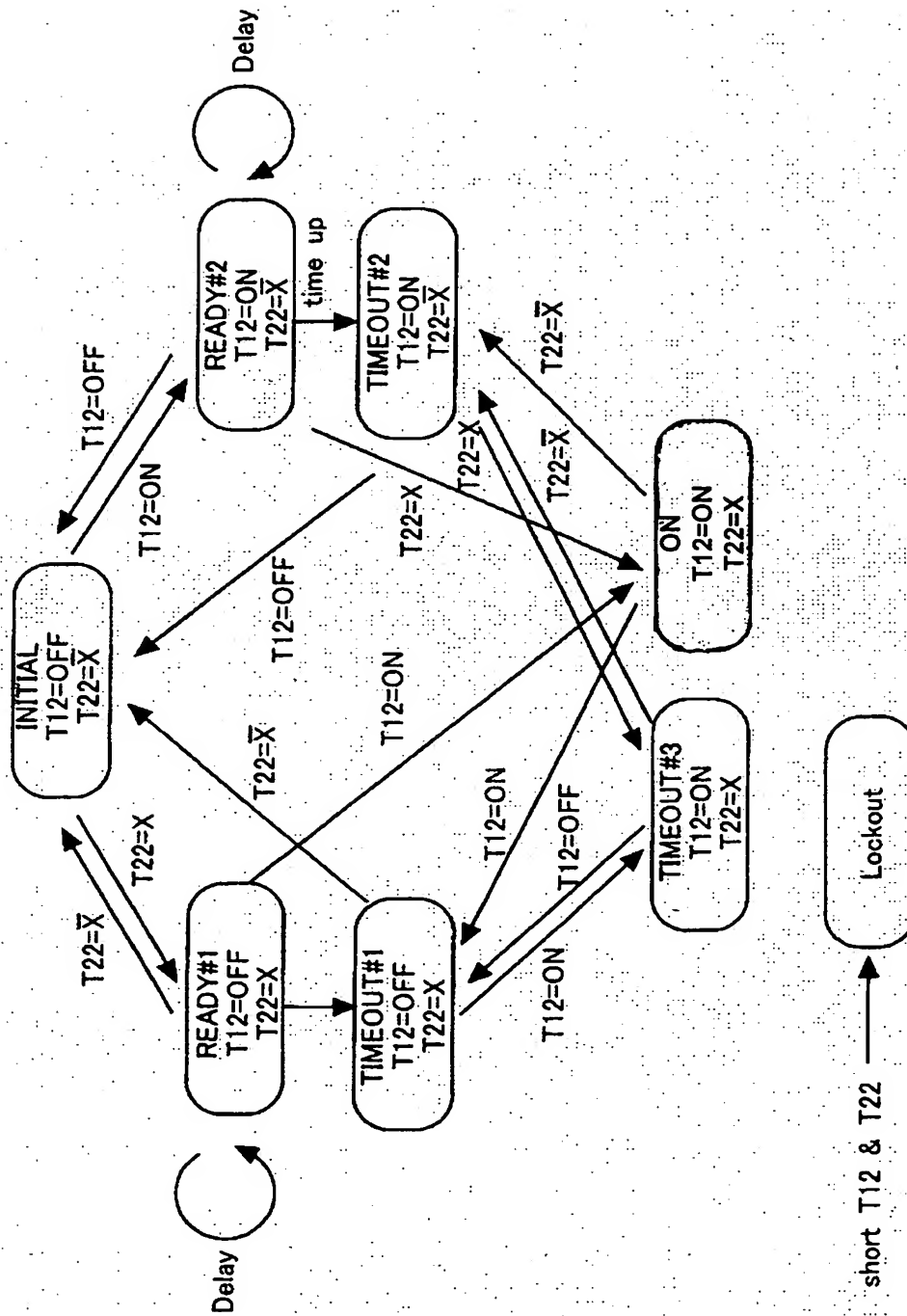


Fig. 40

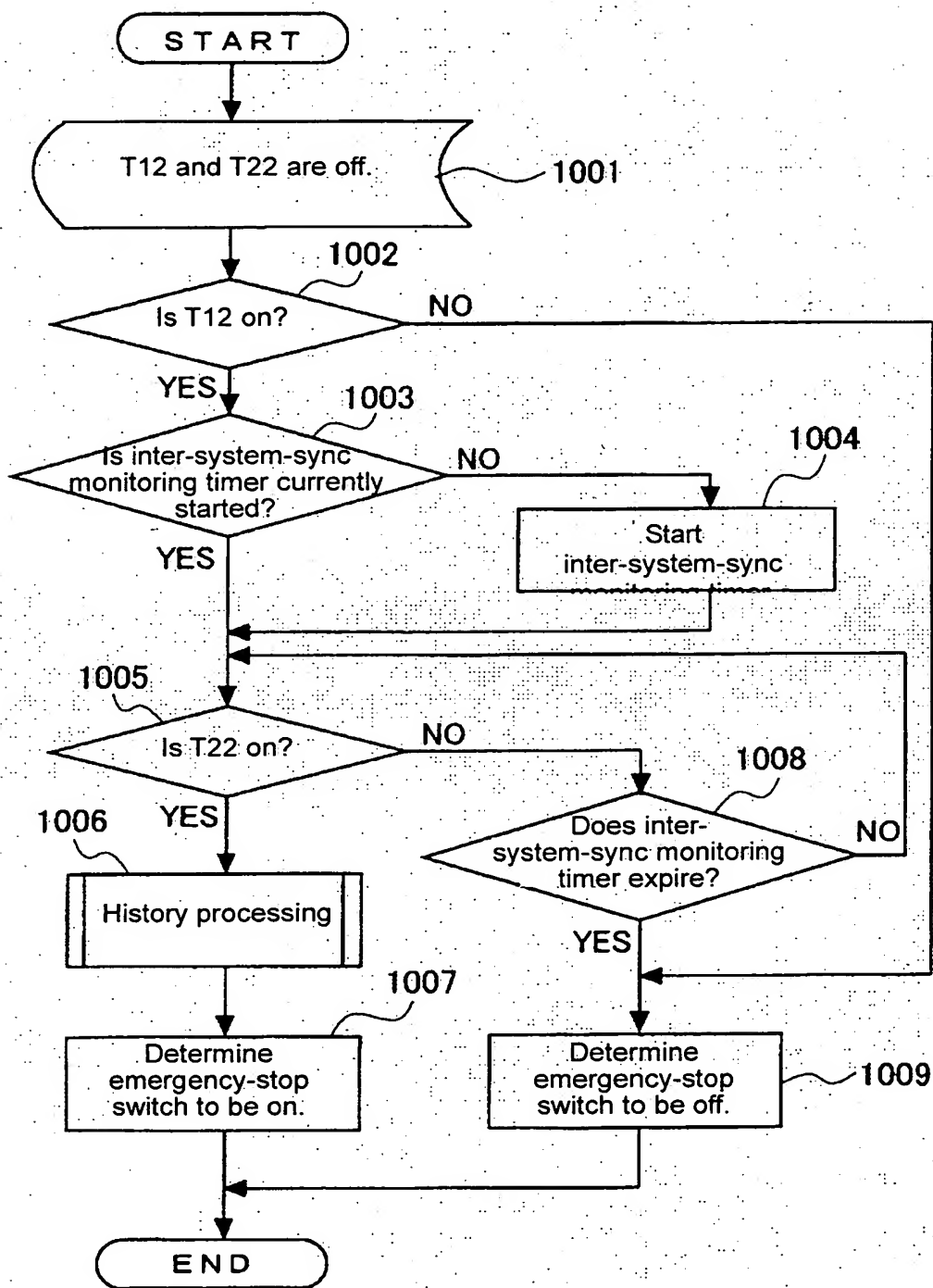




Fig. 41

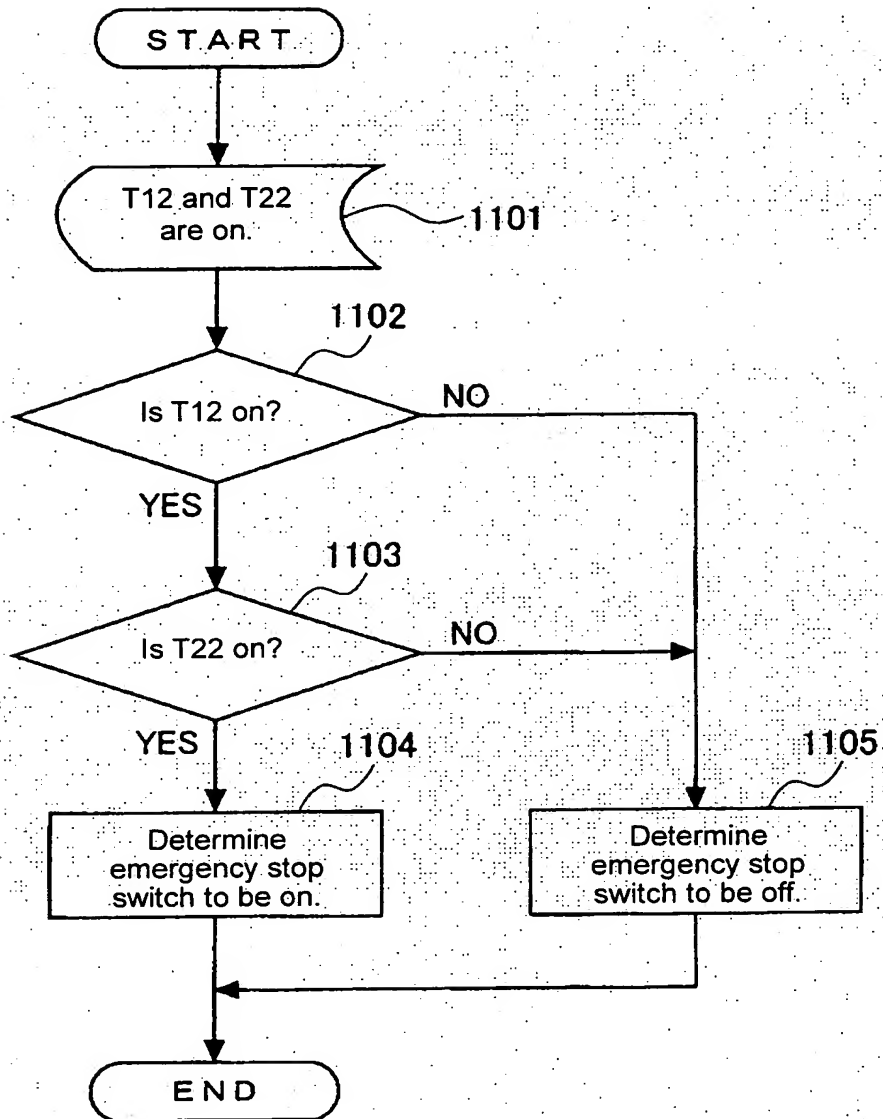
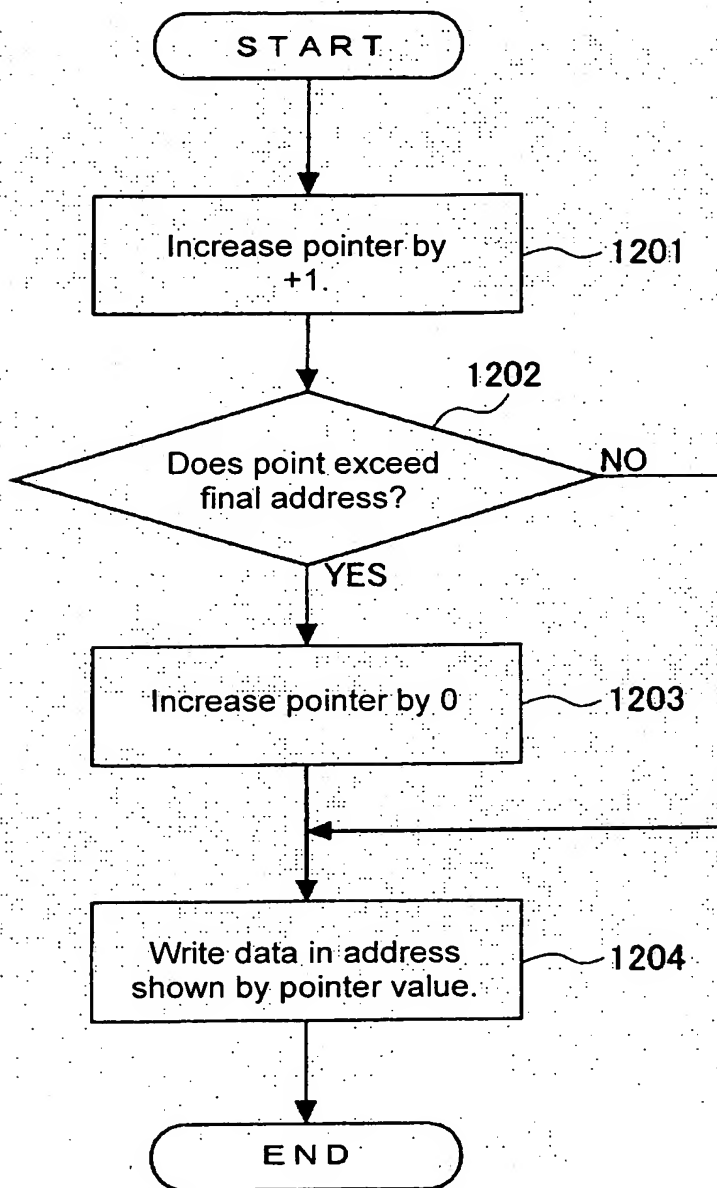


Fig. 42



Address	Measuring time between safety input systems	Pointer position
0001	95ms	
0002	100ms	
0003	102ms	●
0004	100ms	
.	.	
.	.	
000F	98ms	

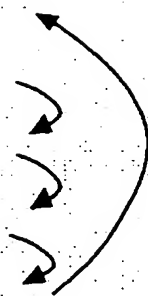


Fig. 43A Memory map of history generation area

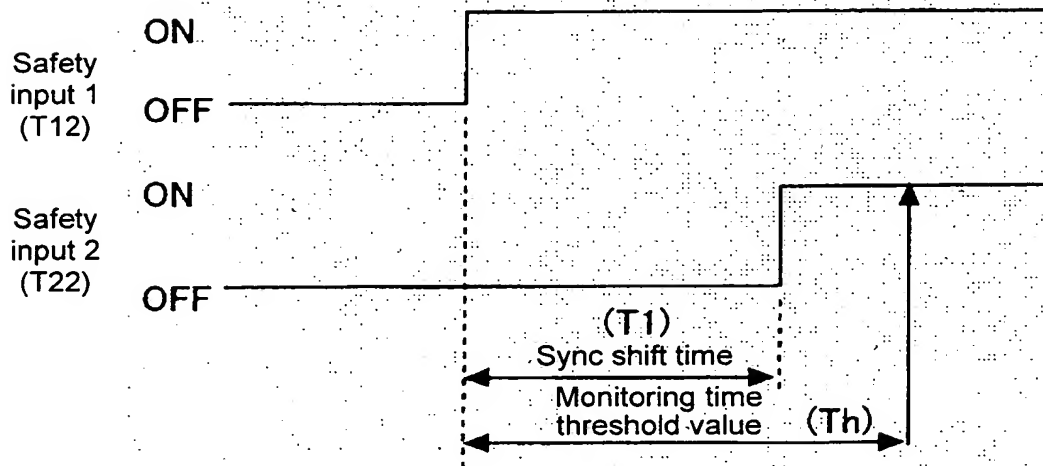
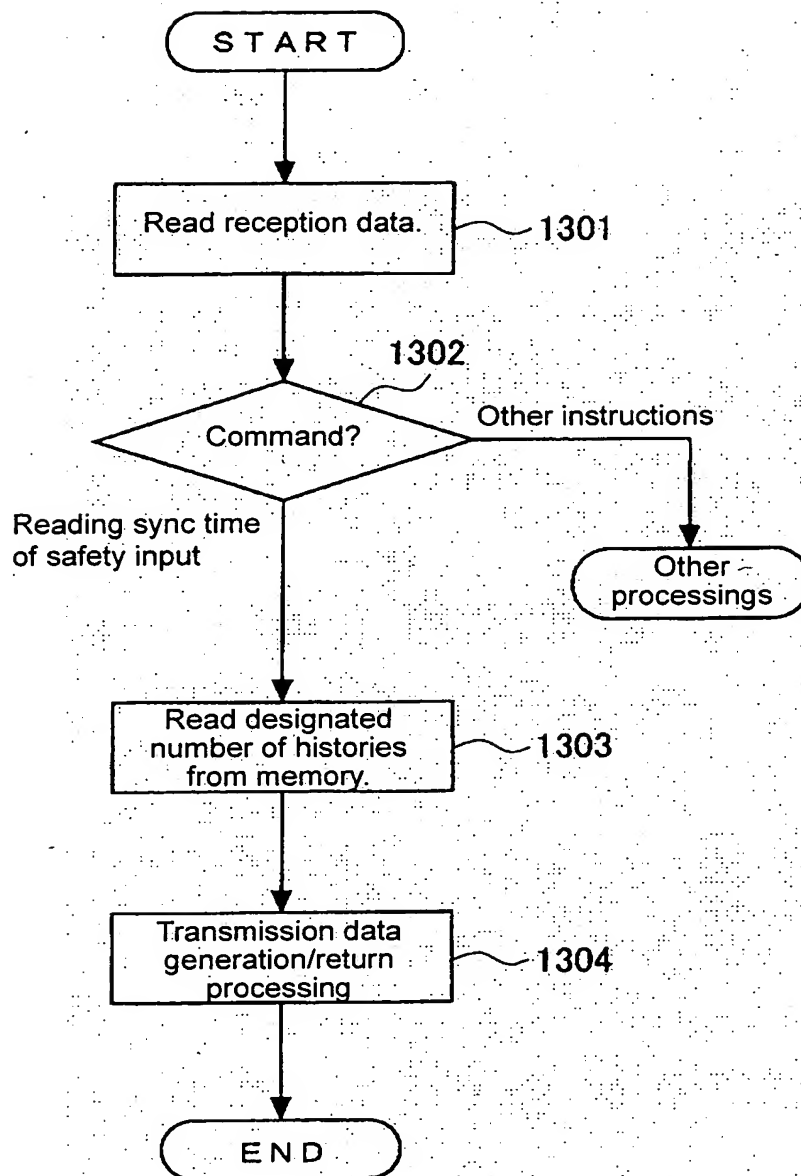


Fig. 43B Waveform diagram for explaining contact welding diagnosis theory

Fig. 44



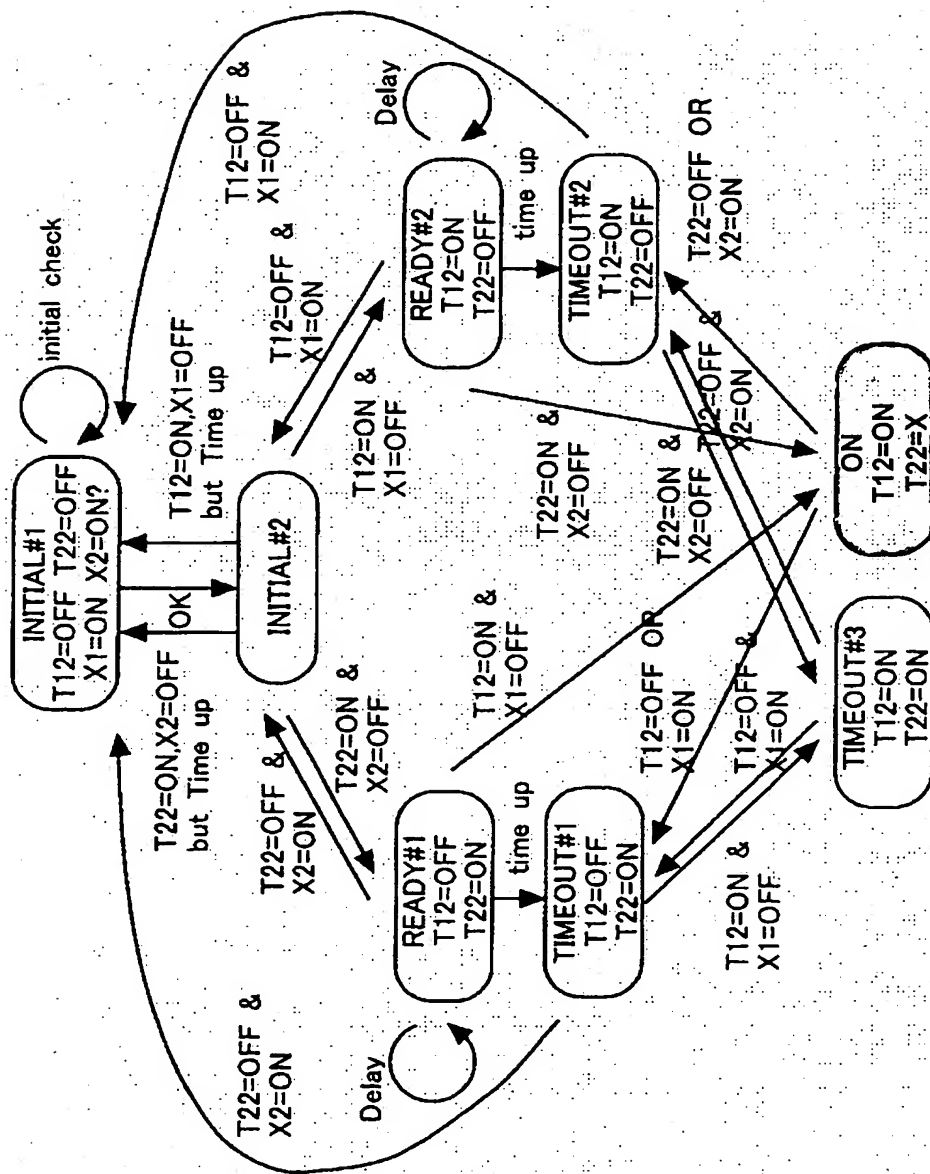


Fig. 45

Fig. 46

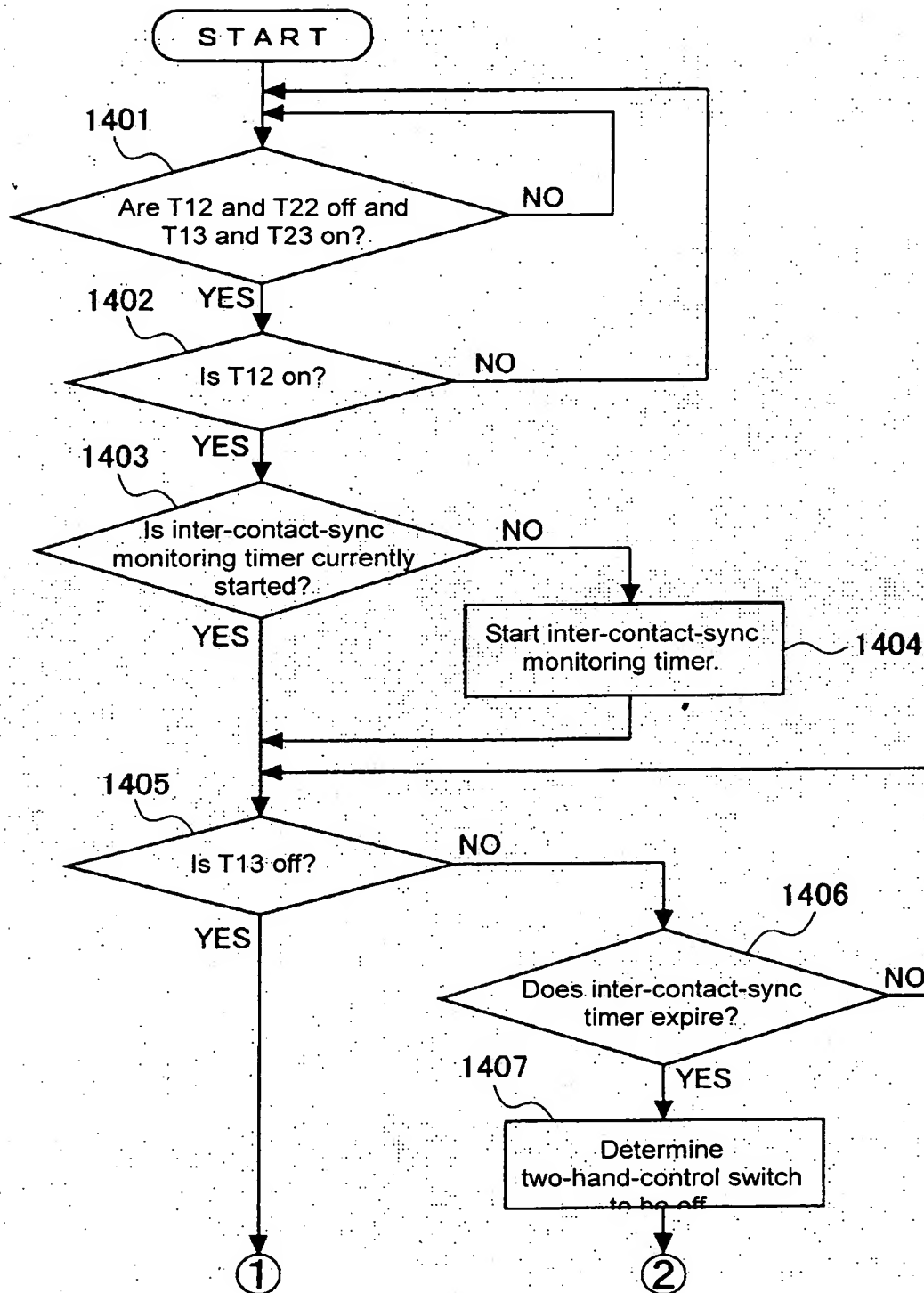


Fig. 47

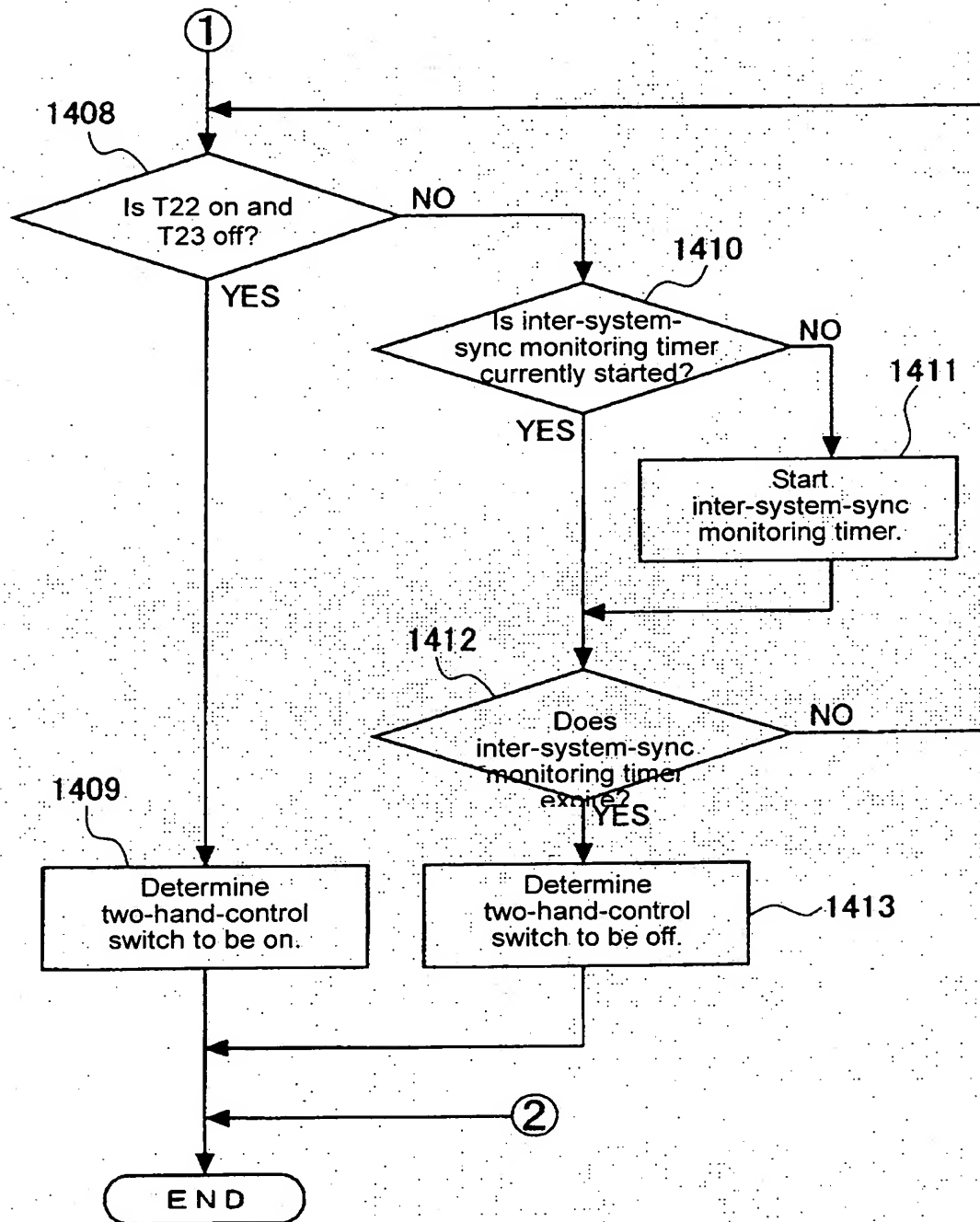


Fig. 48

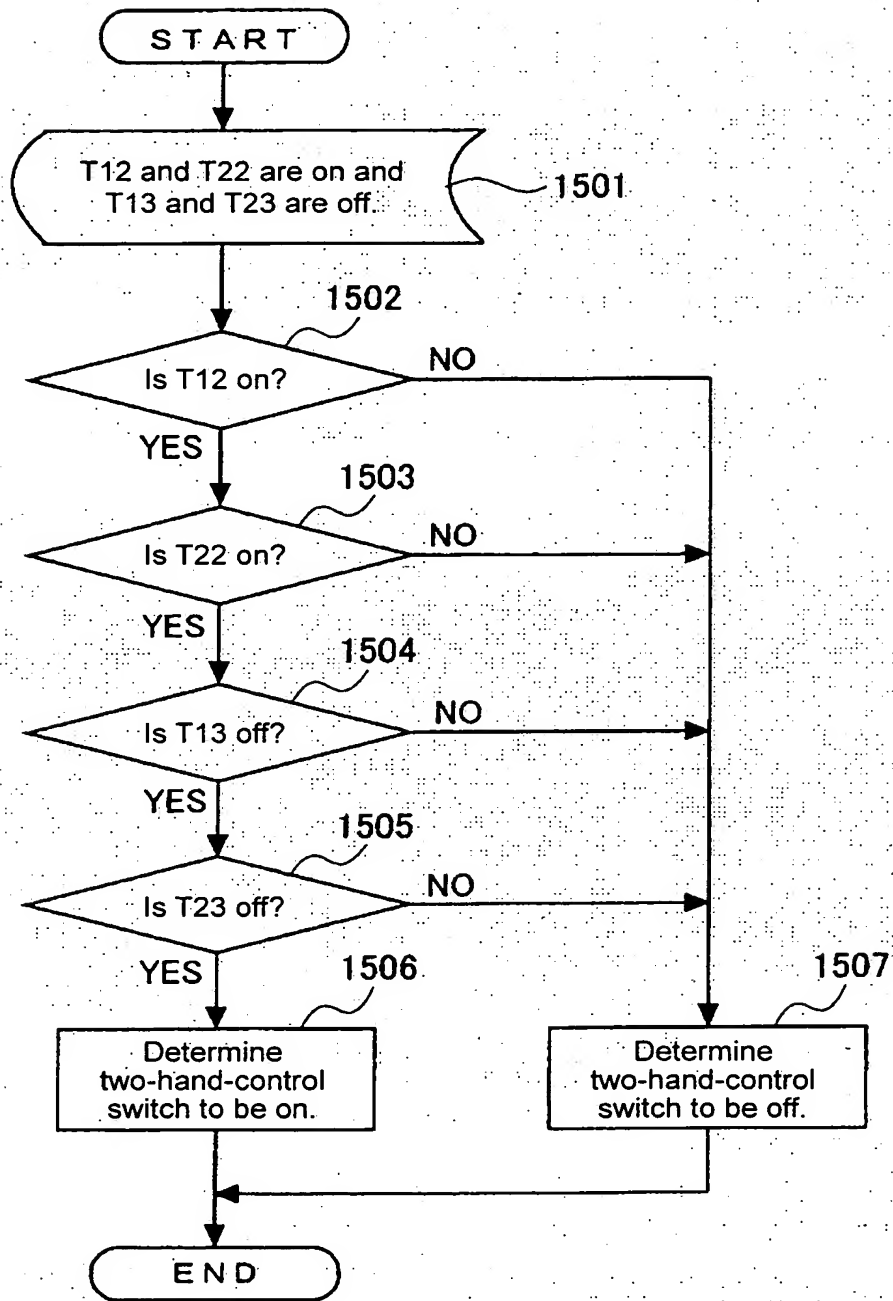




Fig. 49

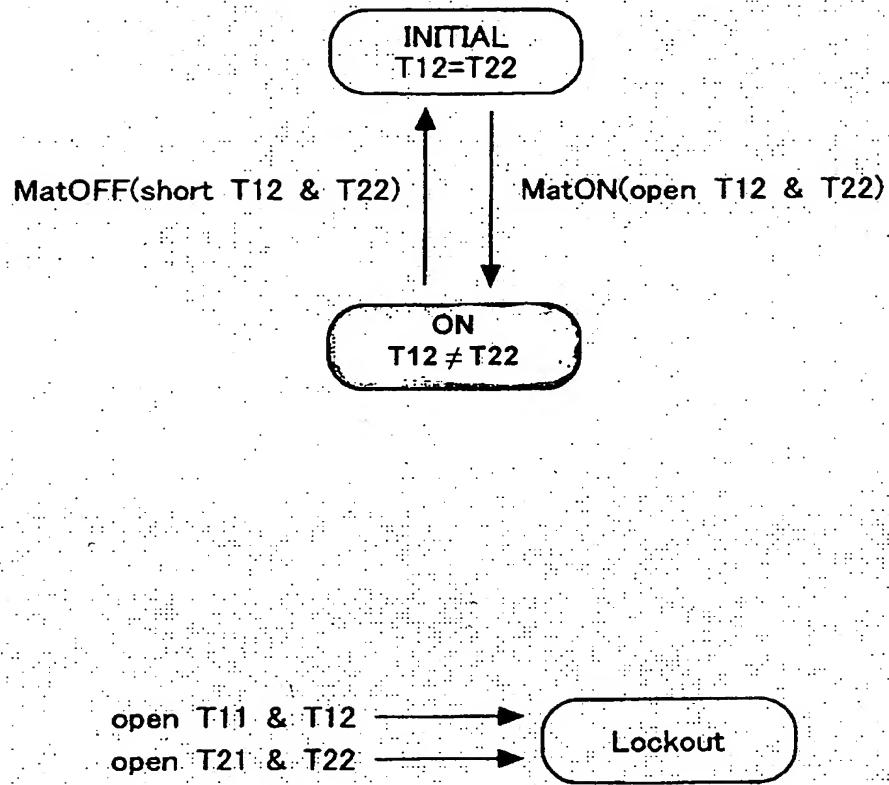


Fig. 50

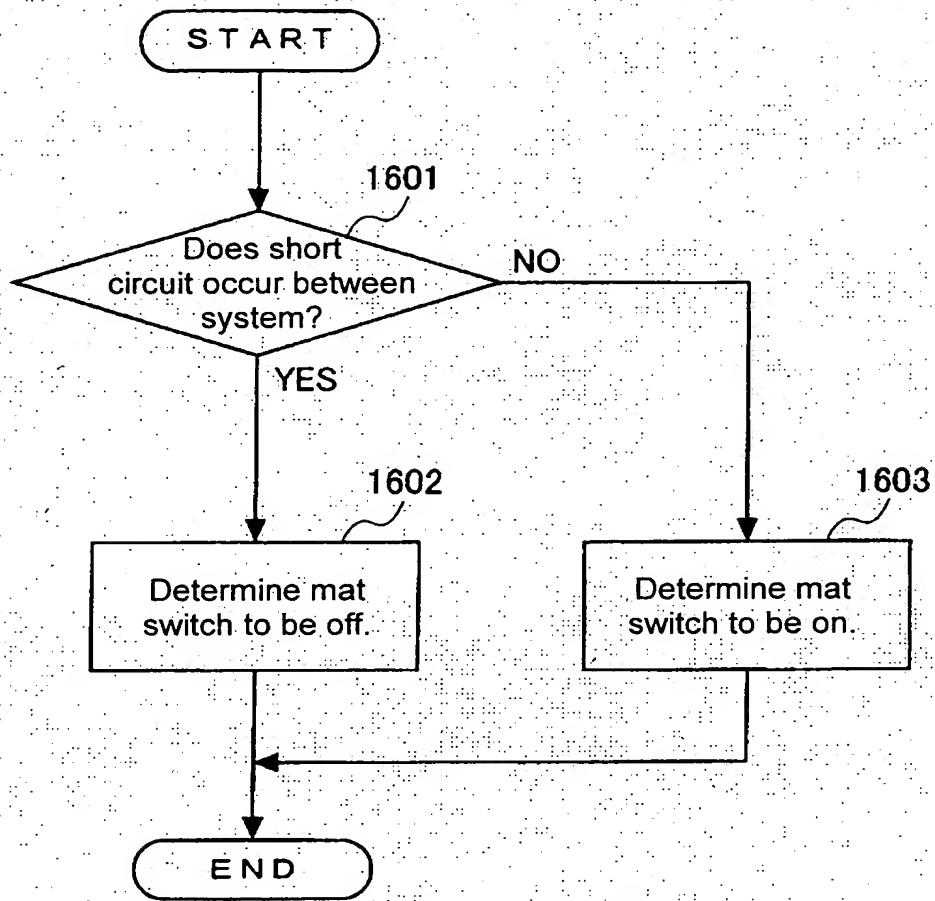


Fig. 51

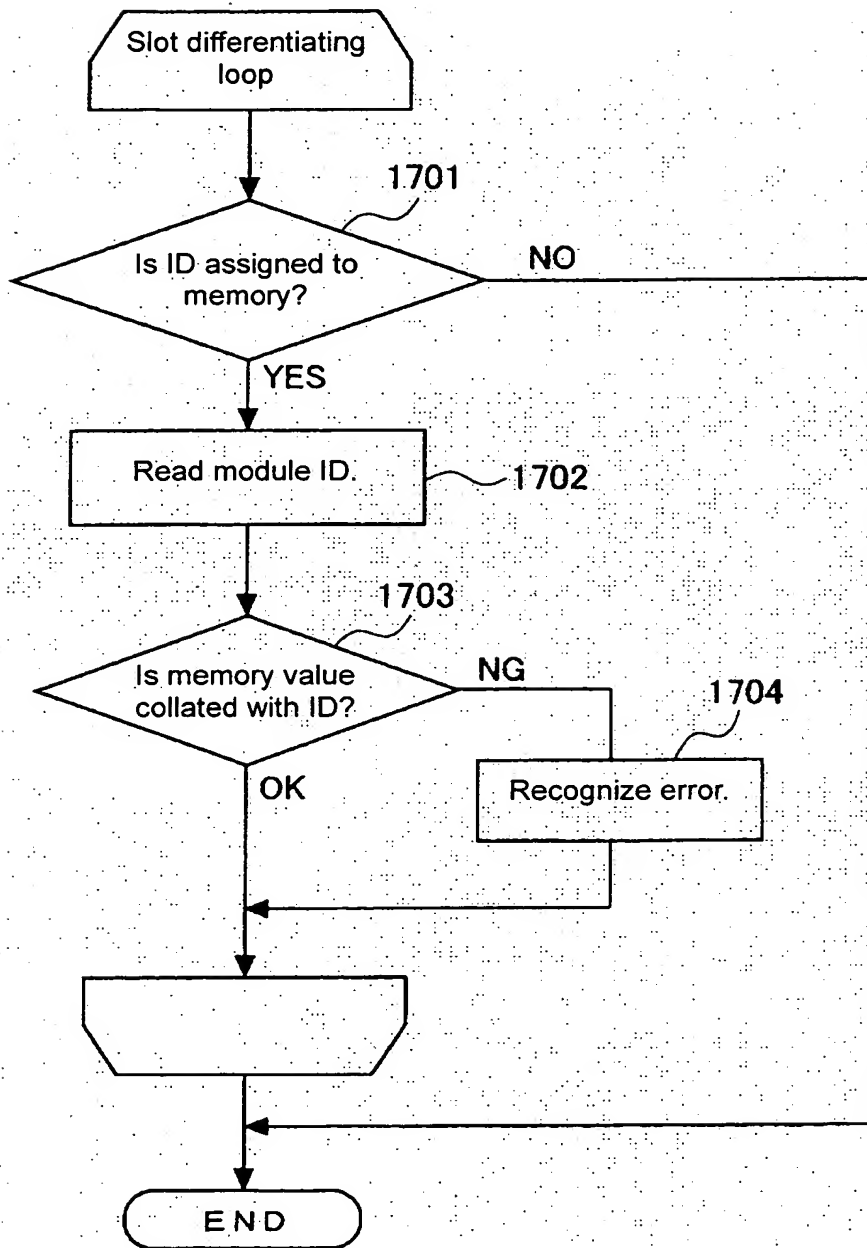


Fig. 52

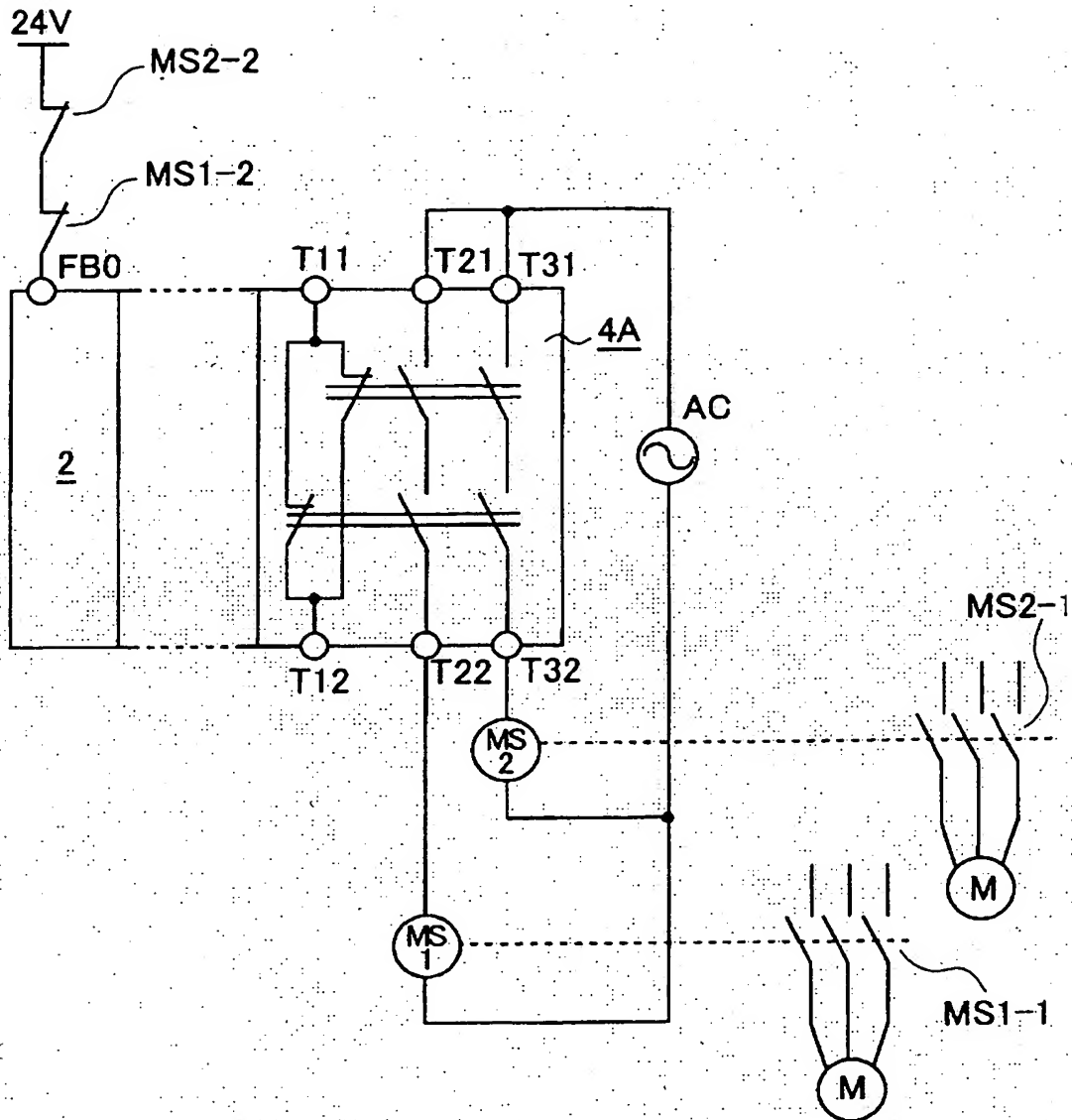


Fig. 53

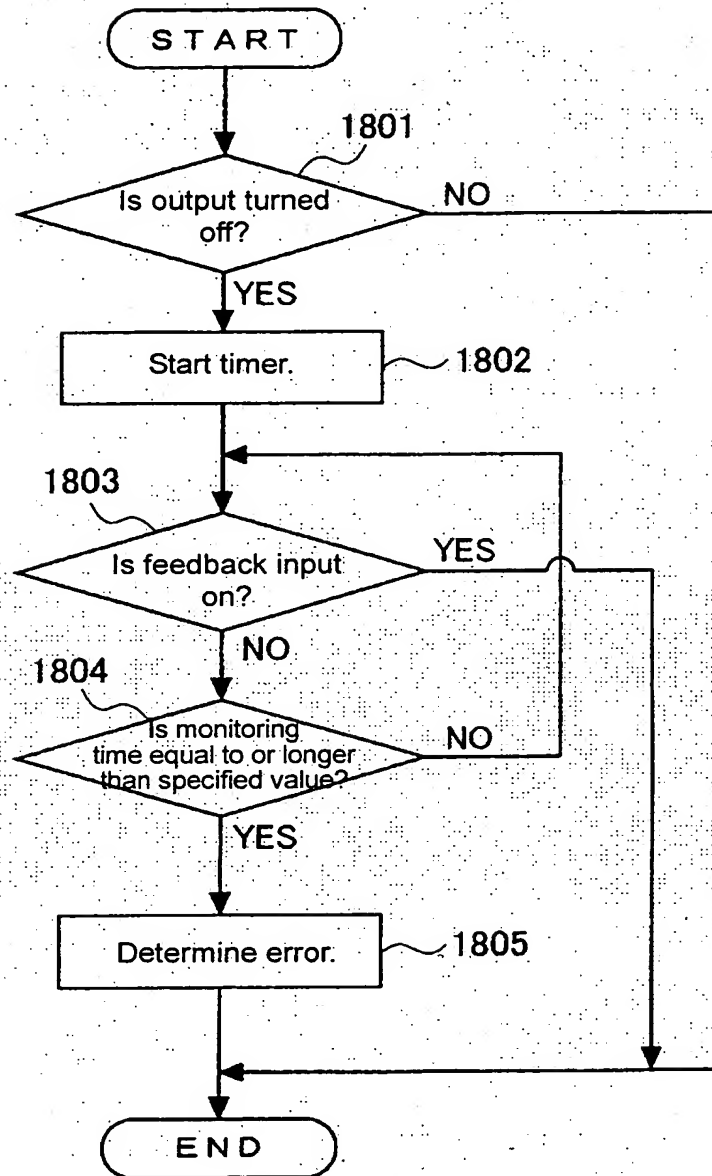
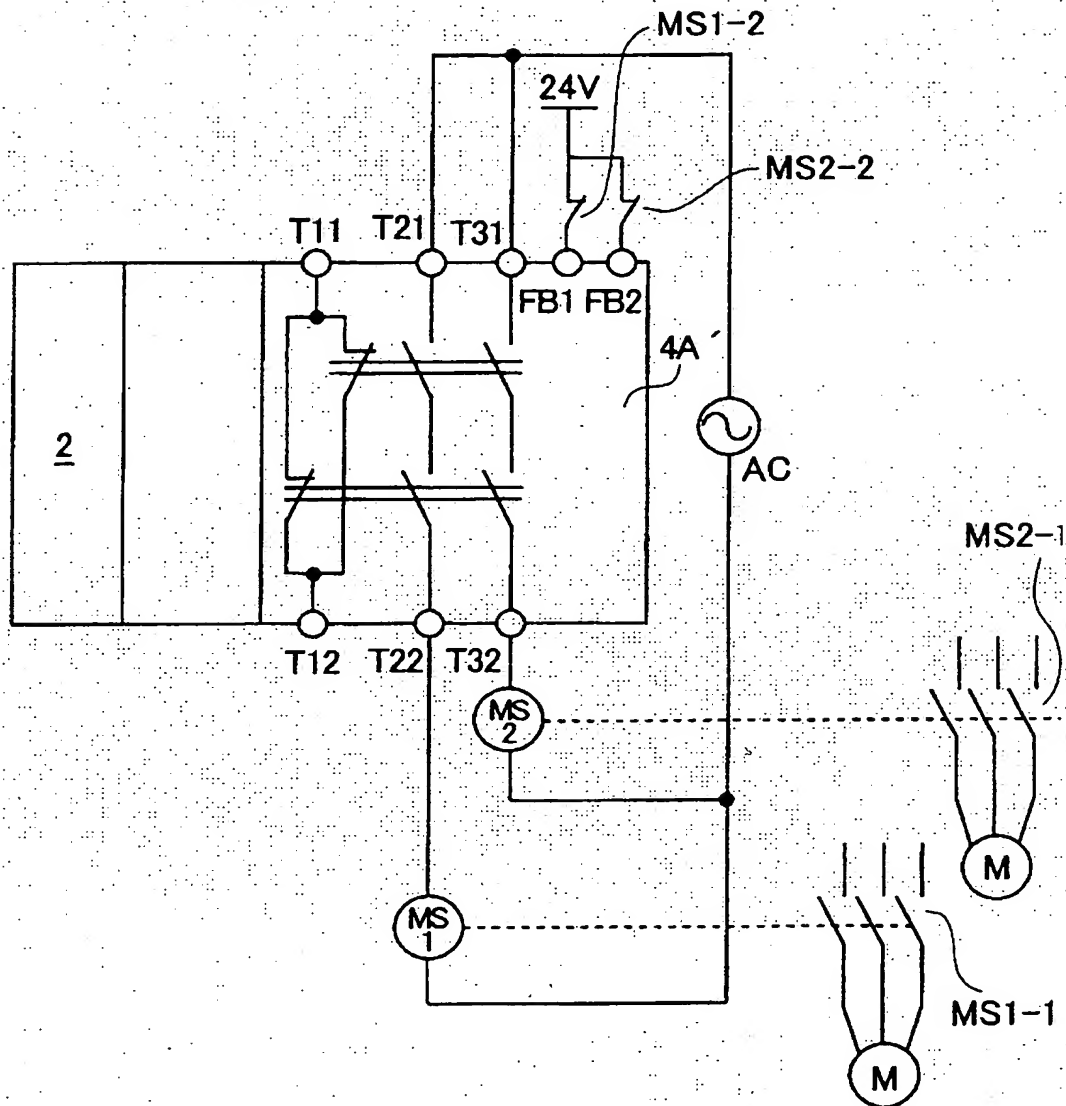


Fig. 54





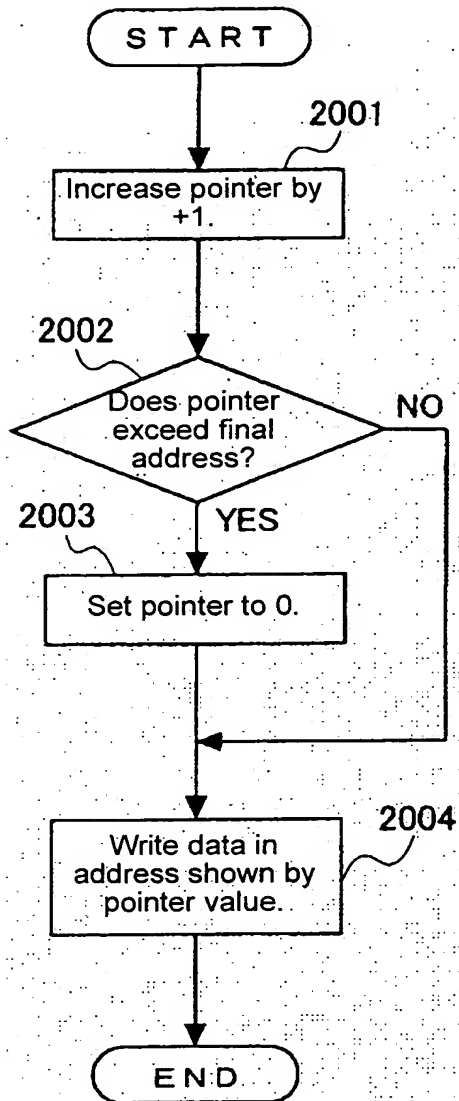


Fig. 56A History generation processing

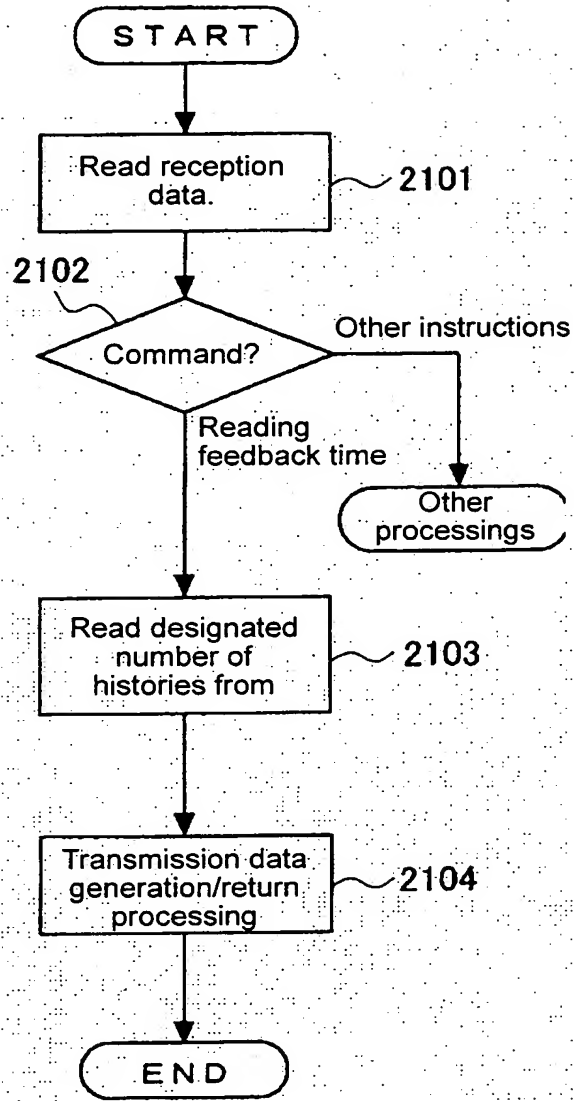


Fig. 56B History read processing



Address	Feedback measuring time	Pointer
0001	95ms	...
0002	100ms	
0003	102ms	●
0004	100ms	
.	.	
.	.	
000F	98ms	




Fig. 57A Memory map of history generation area

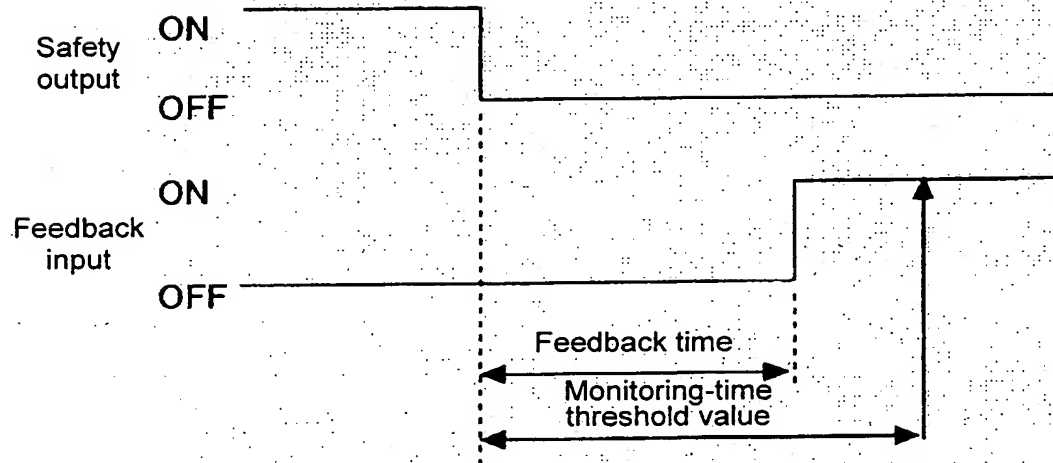


Fig. 57B Waveform diagram for explaining contact welding diagnosis theory

Fig. 58

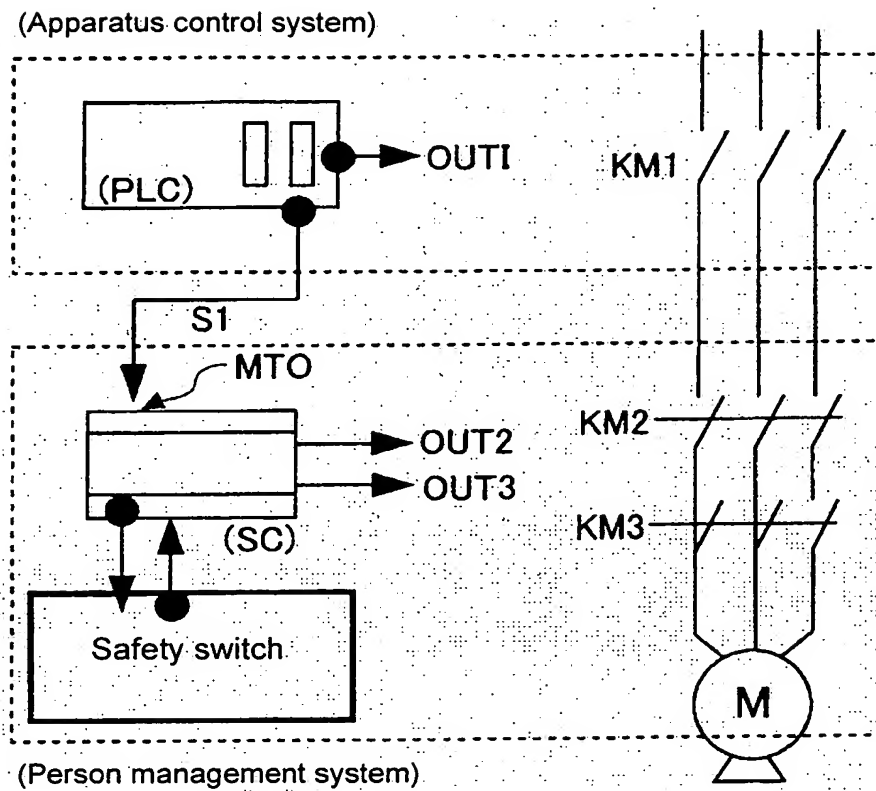


Fig. 59A

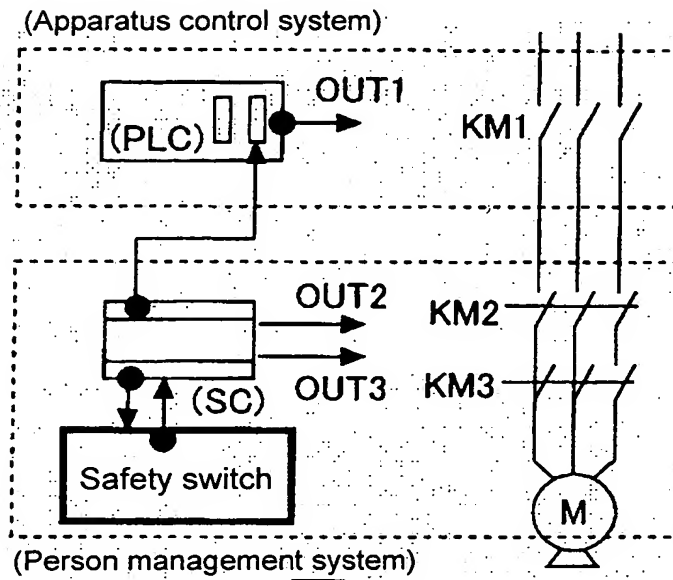
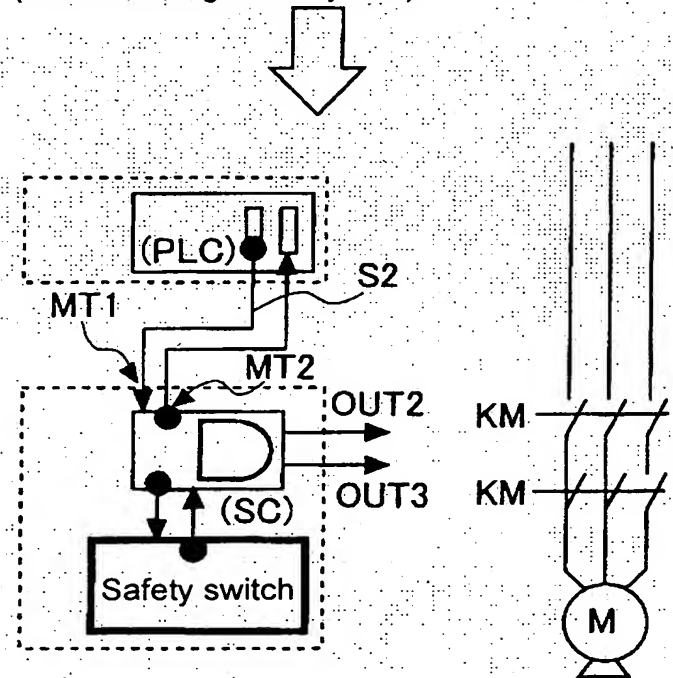


Fig. 59B



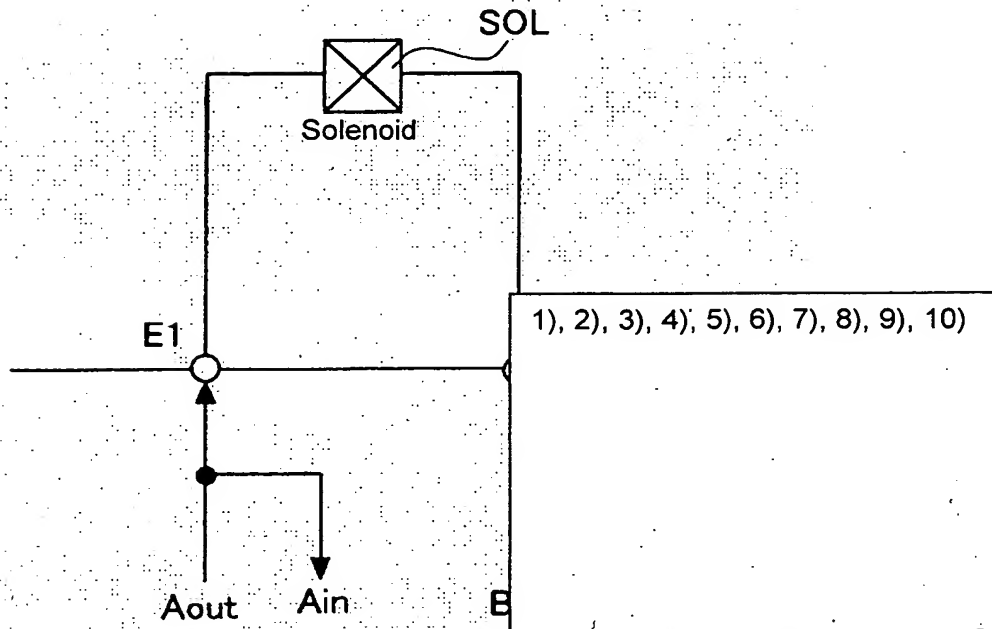


Fig. 60A Block diagram of input circuit

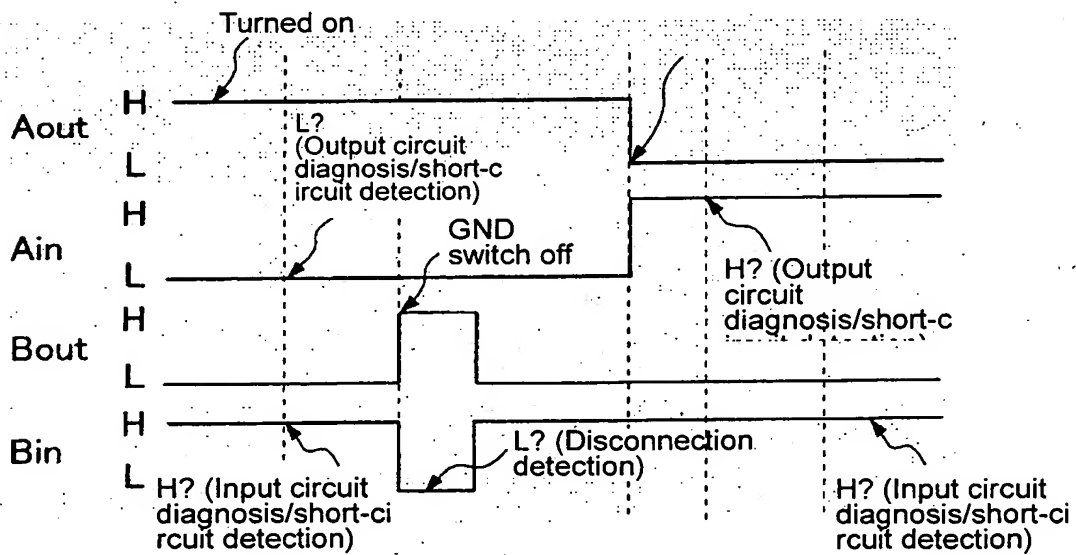


Fig. 60B Waveform diagram for explaining diagnosis theory

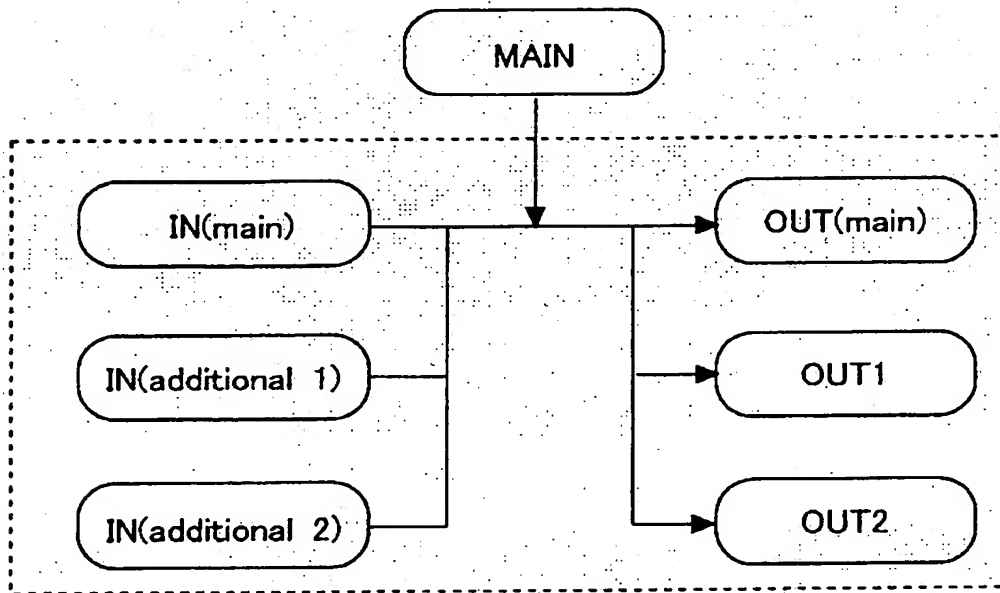


Fig. 61A Simultaneously turning off outputs corresponding to OR

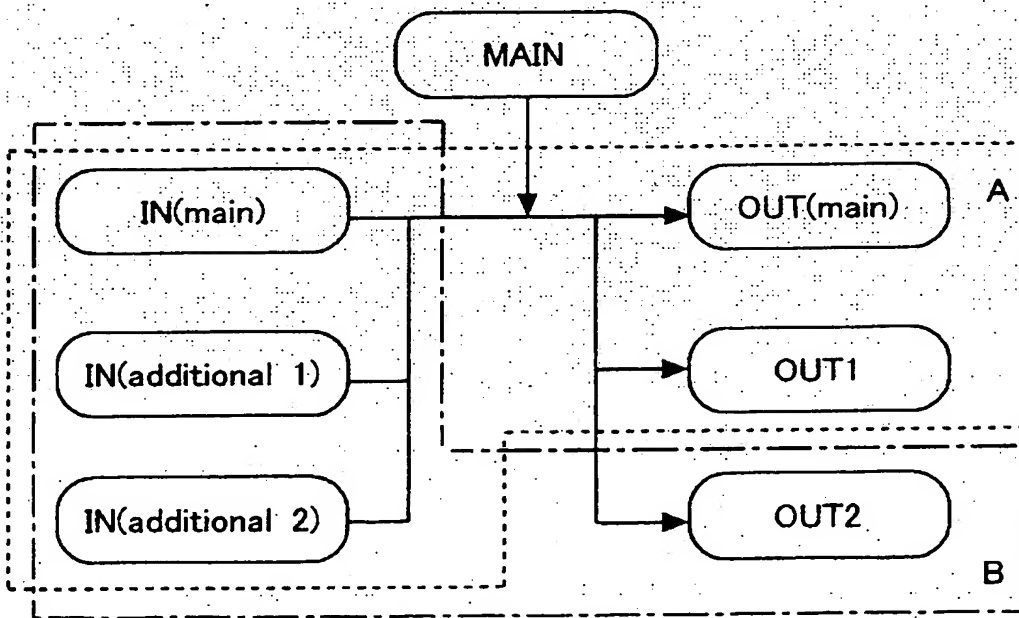


Fig. 61B Simultaneously turning off outputs corresponding to moment and delay

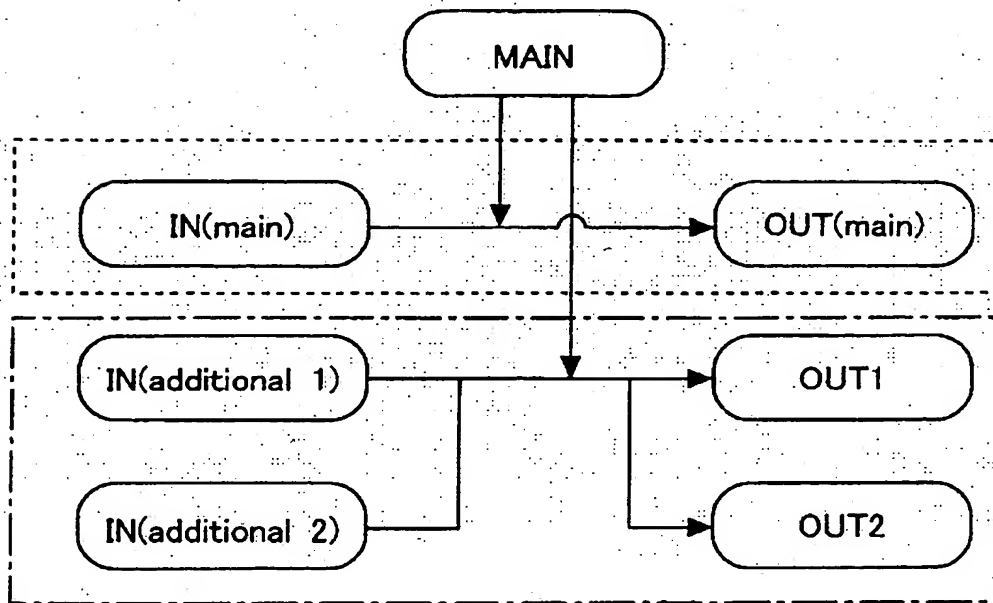


Fig. 62A Output division off corresponding to each input

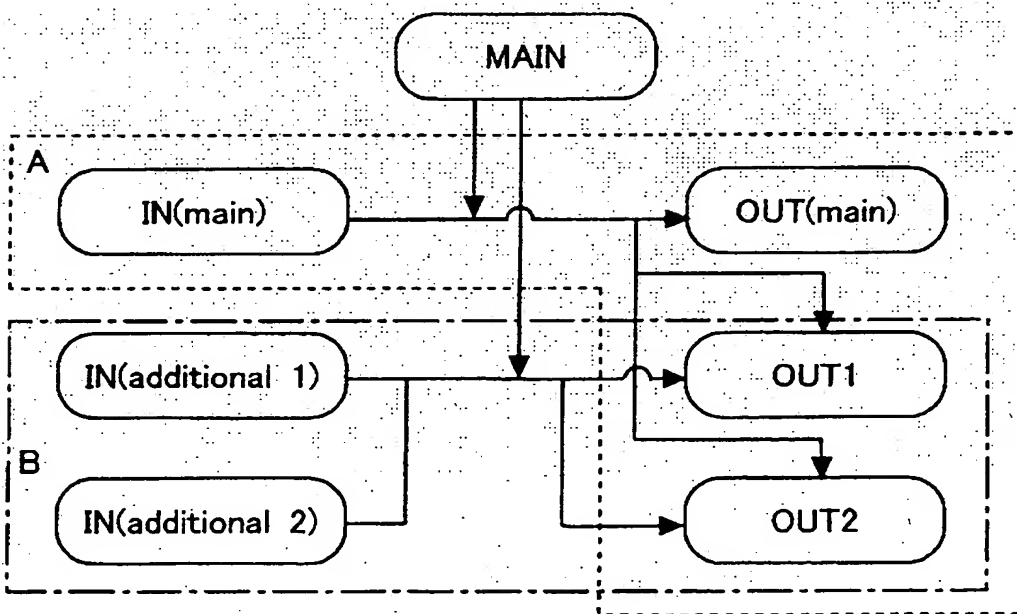


Fig. 62B Output division (partially duplicated) off corresponding to each input